AGRICULTURAL LAW STIFLES INNOVATION AND COMPETITION

Bradley R. Finney

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INTRODUCTION

Agriculture operates in a complex mosaic of federal and state environmental laws, from which it is largely exempt—to its own benefit. In particular, agriculture is exempt from every major federal environmental regulation, including the Clean Water Act (CWA), the Clean Air Act (CAA), and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).[1] The federal government also provides the industry significant financial support.[2] Conspicuously missing from this maze of exemptions, entitlements, and subsidies is any regulation that makes agriculture responsible for the costs of its pollution. The origin of agricultural exceptionalism is a crucial backdrop to understanding policymakers' failure to address agricultural water pollution. The term "agricultural exceptionalism," as used in this Article, encompasses the array of government benefits provided to agriculture, specifically regulatory exemptions, monetary subsidies, and the permission to externalize pollution costs.

Agricultural exceptionalism began amid one of the worst economic periods in the history of the industrialized world,[3] the Great Depression of the 1930s.[4] Farmers could not afford to harvest their crops, so produce and grain rotted in fields while people across the nation starved.[5] In the midst of this desolation,

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1. *See* MEGAN STUBBS, CONG. RSCH. SERV., R41622, ENVIRONMENTAL REGULATION AND AGRICULTURE 7, 14–15 (2014).

2. *See generally Federal Government Direct Farm Program Payments*, USDA ECON. RSCH. SERV., https://data.ers.usda.gov/reports.aspx?ID=17833 (last updated Feb. 5, 2021) (compiling numbers for direct payment programs to farms by state and by overall federal expenditure); *see also generally* JIM MONKE, CONG. RSCH. SERV., R45974, AGRICULTURE AND RELATED AGENCIES: FY2020 APPROPRIATIONS (2020) (reporting on the Agricultural appropriations bill for 2020, which includes anywhere from $152–155 billion in various spending programs for the fiscal year).

3. *See Great Depression History*, HISTORY.COM, https://www.history.com/topics/great-depression/great-depression-history (last updated Feb. 28, 2020) ("The Great Depression was the worst economic downturn in the history of the industrialized world, lasting from 1929 to 1939.").

4. *See* Jonathan Coppess, *A Return to the Crossroads: Farming, Nutrient Loss, and Conservation*, 39 U. ARK. LITTLE ROCK L. REV. 351, 351 (2017) ("American agriculture suffered twin disasters in the 1930s with the Great Depression and the Dust Bowl. In response, Congress created policies to assist and support farmers; efforts that included assistance and support for conserving soil resources.").

5. *See Great Depression History*, *supra* note 3.

policymakers crafted regulations to allow agriculture to succeed.[6] In the decades since, policymakers have continued this protectionist stance toward agriculture while developing and expanding the benefits provided.[7]

Today, critics on both sides of the political aisle castigate agricultural exceptionalism.[8] Some critics have chastised it for its market distortion,[9] while others have widely attacked it for the environmental degradation the industry causes and this exceptionalism encourages.[10] Both sides argue that agricultural exceptionalism is a relic of another era and is no longer needed. Both are correct.

Agricultural policy and subsidies influence the crops farmers choose to grow with little consideration for consumer demand.[11] These policies also restrict healthy competition within the industry.[12] Additionally, agriculture causes serious environmental harm, and many of the policies meant to prop up the industry also encourage and exacerbate this harm.[13] Agricultural exceptionalism represented understandable and arguably necessary policy

6. *See* Jason Foscolo & Michael Zimmerman, *Alternative Growth: Forsaking the False Economies of Industrial Agriculture*, 25 FORDHAM ENV'T L. REV. 316, 316 (2014) (discussing agricultural exceptionalism beginning with the Agricultural Adjustment Act of 1933).

7. Agricultural exceptionalism in the 1930s was largely in the form of direct financial support. *See* Jodi Soyars Windham, *Putting Your Money Where Your Mouth Is: Perverse Food Subsidies, Social Responsibility & America's 2007 Farm Bill*, 31 ENVIRONS: ENV'T L. & POL'Y J. 1, 6–7 (2007). Since the Great Depression, major environmental regulations have been enacted, mostly in the 1970s, but agriculture is largely exempt from those regulations. *See* Foscolo & Zimmerman, *supra* note 6, at 317; *see also* sources cited *infra* note 226. Direct financial support continues on in other various ways as well. *See* sources cited *infra* note 229 and accompanying text.

8. *See, e.g.*, Anthony Kammer, *Cornography: Perverse Incentives and the United States Corn Subsidy*, 8 J. FOOD L. & POL'Y 1, 41–42 (2012) (noting the unpopularity of agricultural subsidies with both the political right and left due to the "market distortions and inefficiencies" as well as "the subsidies' environmental impact").

9. *Id.* at 41.

10. *Id.* at 42; *see also* Susan A. Schneider, *A Reconsideration of Agricultural Law: A Call for the Law of Food, Farming, and Sustainability*, 34 WM. & MARY ENV'T L. & POL'Y REV. 935, 937 (2010) (calling for "a reconsideration of the framework of agricultural law and the development of an agricultural policy that supports and encourages a sustainable food policy") [hereinafter Schneider, *A Reconsideration of Agricultural Law*].

11. William S. Eubanks II, *A Rotten System: Subsidizing Environmental Degradation and Poor Public Health with Our Nation's Tax Dollars*, 28 STAN. ENV'T L.J. 213, 280 (2009) ("The Farm Bill has produced a very distorted food system by sending signals to farmers in the form of commodity crop subsidies that tell farmers what they must grow in order to survive.").

12. Foscolo & Zimmerman, *supra* note 6, at 335 ("By tightening environmental restrictions on conventional agriculture, lawmakers could both realign farms' economic priorities and begin to level the field of competition between conventional and alternative food producers."); *see also* Michael E. Porter & Claas van der Linde, *Toward a New Conception of the Environment-Competitiveness Relationship*, 9 J. ECON. PERSPS. 97, 116 (1995) ("The United States and other countries need an entirely new way of thinking about the relationship between environment and industrial competitiveness—one closer to the reality of modern competition.").

13. Thomas K. Ruppert, *Water Quality Trading and Agricultural Nonpoint Source Pollution: An Analysis of the Effectiveness and Fairness of EPA's Policy on Water Quality Trading*, 15 VILL. ENV'T. L.J. 1, 26 (2004).

choices in the 1930s.[14] Today, however, agricultural exceptionalism results in significant consequences without that same need.

The primary claim of this Article is that agricultural exceptionalism stifles innovation of technological developments that reduce water pollution while also hindering competition within the agriculture industry. The lack of innovation and competition causes significant harm to the industry. Agricultural exceptionalism also results in an inequitable assignment of many of agriculture's burdensome pollution costs to society. This Article calls for a shift toward placing limits on agricultural exceptionalism to more fairly apportion the industry's liability for the costs of its actions and thus encourage it to adapt its operations while also spurring competition.

Agricultural exceptionalism suppresses innovation. Regulatory exemption allows the industry to dispose of its pollution in water sources because agriculture largely does not have to comply with the CWA and other water-related environmental statutes.[15] Thus, agriculture externalizes the expansive costs of its water pollution by assigning them to society, which must filter and treat water, pay for increased medical care, and suffer the reduced profitability of clean, water-reliant economies.[16] Because of cost externalization, the disposal of these harmful pollutants is cheap for the industry.[17] There are expansive costs to agriculture's water pollution, but society is assigned those costs.[18] Given this special treatment, agriculture has little incentive to create

14. Laurie Ristino & Gabriela Steier, *Losing Ground: A Clarion Call for Farm Bill Reform to Ensure a Food Secure Future*, 42 COLUM. J. ENV'T L. 59, 79–82 (2016) (discussing that pro-agriculture regulations were established in the 1930s during falling commodity prices, the Dust Bowl, and the Great Depression).

15. *See* MEGAN STUBBS, CONG. RSCH. SERV., R41622, ENVIRONMENTAL REGULATION AND AGRICULTURE 7, 24 (2014) ("In other words, effective immediately, producers who utilize any of the 56 identified practices according to USDA technical standards need not seek a determination of CWA jurisdiction and need not seek a CWA permit.").

16. Nicole E. Negowetti, *Exposing the Invisible Costs of Commercial Agriculture: Shaping Policies with True Costs Accounting to Create a Sustainable Food Future*, 51 VAL. U. L. REV. 447, 466 (2017) ("When a large agricultural operation, for example, uses excessive amounts of water or fertilizers, there is no legal obligation to take financial responsibility for the environmental effects.").

17. Susan A. Schneider, *Reconsidering the Industrialization of Agriculture*, 26 J. ENV'T. L. & LITIG. 19, 23–24 (2011) ("The significant environmental costs associated with industrialized agriculture are often economic externalities, that is, costs that are not reflected in the marketplace. Externalities such as pollution impose costs on others without being factored into the economic model or the decision making of the industry . . . .") (footnote omitted) [hereinafter Schneider, *Reconsidering the Industrialization of Agriculture*]. The costs externalized by conventional agriculture's pollution are vast but include the following: health care, soil fertility loss and erosion, loss of biodiversity, treatment and filtration costs, and decreased revenue of businesses reliant on clean water. *See* Schneider, *supra* note 10, at 953; Mary Jane Angelo, *Corn, Carbon, and Conservation: Rethinking U.S. Agricultural Policy in a Changing Global Environment*, 17 GEO. MASON L. REV. 593, 602–13 (2010); Negowetti, *supra* note 16, at 450–58.

18. UNITED NATIONS FOOD AND AGRIC. ORG., MORE PEOPLE, MORE FOOD, WORSE WATER? A GLOBAL REVIEW OF WATER POLLUTION FROM AGRICULTURE 5–6 (Javier Mateo-Sagasta et al. eds., 2018) [hereinafter 2018 UN REPORT ON AGRICULTURE] ("The costs of agricultural pollution are generally non-market externalities, which are borne by society as a whole. Water pollution from agriculture has direct negative impacts on human health, for example . . . . Water-quality degradation may also have severe direct impacts on productive activities, including agriculture itself.").

new pollution-reducing technology.[19] It does not make financial sense for a farmer to invest money developing and implementing technology to reduce costs that are paid by others.[20]

Agricultural exceptionalism also limits competition within the industry.[21] Subsidies distort the industry's reliance on market signals to make strategic decisions that align with consumer demands.[22] The industry's focus is often on receiving subsidies rather than delivering a product that satisfies demand.[23] Thus, players in the industry compete to receive subsidies, not to satisfy consumer preferences.[24] Additionally, because of the regulatory exemptions and cost externalization, there is a lack of competition focused on developing new innovations to limit pollution and reduce attendant costs.[25] As a result of this lack of competition, society bears more costs.[26] If agriculture was not exempt and was assigned more responsibility for its pollution, the industry would compete to reduce pollution and the costs of that pollution.[27]

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19. *See* Angelo, *supra* note 17, at 638 ("Much of current agricultural policy has not evolved to keep up with the dramatic global changes that have occurred since the 1930s and thus does not fulfill certain societal goals.").

20. One strikingly similar exception to a broader EPA rule, the so-called Glider Kit Loophole, drew identical criticism in 2018 on the basis of the loophole's tendency to encourage higher levels of pollution and discourage competition and innovation. *See generally* RICHARD K. LATTANZIO & SEAN LOWRY, CONG. RSCH. SERV., R45286, GLIDER KIT, ENGINE, AND VEHICLE REGULATIONS 3–4 (2018) (explaining the loophole allowing for older and less efficient trucks to be rebuilt and resold as new "used" vehicles that were exempted from newer regulations under the Clean Air Act). Many critics were within the trucking industry itself, arguing that the loophole created an unfair competitive disadvantage for those pursuing innovation within the industry and those "businesses that have invested in cleaner engine and emission control technologies." *Id.* at 9; *see also* Erin Murphy, *Freight Truck Fleets, Manufacturers, and Dealers to Pruitt: Stop Supporting Super-Polluting Glider Trucks*, ENV'T DEF. FUND (Jan. 24, 2018) (alteration in original) (quoting the Public Comment of the Truck and Engine Manufacturer's Association to the proposed rule change allowing the Glider Kit Loophole), http://blogs.edf.org/climate411/2018/01/24/freight-truck-fleets-manufacturers-and-dealers-to-pruitt-stop-supporting-super-polluting-glider-trucks ("[S]uch a loophole would be especially damaging to EMA's members who have invested hundreds of millions of dollars in advanced technologies – technologies that make them the world's leaders in the manufacture of new heavy-duty and medium-duty on-highway engines and vehicles.").

21. Foscolo & Zimmerman, *supra* note 6, at 335; Porter & van der Linde, *A New Conception*, *supra* note 12, at 116.

22. *See* Eubanks, *supra* note 11, at 280.

23. *See id.*; William Petit, Comment, *The Free Trade Area of the Americas: Is It Setting the Stage for Significant Change in U.S. Agricultural Subsidy Use?*, 37 TEX. TECH L. REV. 127, 135, 141 (2004) (concluding that financial support provided by the government results in farmers producing more crops than consumers demand so that the farmers can receive the subsidies).

24. *See* Eubanks, *supra* note 11, at 280; Petit, *supra* note 23.

25. Foscolo & Zimmerman, *supra* note 6, at 318 ("When forced to internalize the actual costs of their activities, whether by mandated use of cleaner technologies, permit costs, or penalties for noncompliance, regulated industries are given a tangible incentive to diminish their pollution output."); Schneider, *supra* note 10, at 962; Margaret Rosso Grossman, *Agriculture and the Polluter Pays Principle: An Introduction*, 59 OKLA. L. REV. 1, 39 (2006) (citing ORG. OF ECON. CO-OPERATION AND DEV., AGRICULTURE AND THE ENVIRONMENT: LESSONS LEARNED FROM A DECADE OF OECD WORK (2004)).

26. *See* Foscolo & Zimmerman, *supra* note 6, at 318; *see also* Schneider, *supra* note 10, at 961–62.

27. Foscolo & Zimmerman, *supra* note 6, at 318.

Regulatory change is necessary to curtail agricultural exceptionalism and make the industry more liable for the costs of its actions.[28] There are several different policy mechanisms through which that change can occur.[29] This Article discusses several of those solutions, including banning certain fertilizers, taxing agriculture's water pollution, requiring more transparency and availability of information, and restructuring current regulations to eliminate agriculture exemptions and force cost-internalization.[30]

This Article considers the financial impact of agricultural exceptionalism. It also analyzes the financial impact if these exemptions and subsidies were curtailed through the lens of an important and influential economic theory, the Porter Hypothesis.[31] Although the regulatory exemptions and monetary subsidies provided to agriculture and the impact of such exceptions on the environment have been discussed in other articles,[32] this Article applies the Porter Hypothesis to agricultural exceptionalism and analyzes, through the lens of that theory, the resulting financial impact of rolling back such exemptions and subsidies. This Article concludes by discussing solutions that utilize the perspectives gained from the Porter Hypothesis and that limit the pervasive effect of agricultural exceptionalism on water pollution.

Glancing at any newspaper or watching any news program reveals that agriculture pollution is currently a controversial subject. A few illustrative headlines include the following: *14 States Sue EPA over Rollback of Obama-Era Water Rule*;[33] *Rich Farmers, Not Mom-and-Pop Farms, Will Collect Most of Trump's Tariff Bailout*;[34] *We're Suing Iowa for Choosing Big Ag Over Clean Water*;[35] *Groups Sue Iowa for Farm Pollution into Racoon River*.[36]

Such controversy exists because emissions of various agricultural pollutants into water sources are causing changes to the environment that could permanently alter how humans live[37] and threaten human health in devastating

28. *Id.* at 335–37.

29. *See infra* Part IV.

30. *Id.*

31. *See* Porter & van der Linde, *A New Conception*, *supra* note 12.

32. *See generally infra* Parts I and II (citing sources discussing these topics).

33. Rebecca Beitsch, *14 States Sue EPA over Rollback of Obama-Era Water Rule*, THE HILL (Dec. 20, 2019), https://thehill.com/policy/energy-environment/475500-14-states-sue-epa-over-rollback-of-obama-era-water-rule.

34. Michael Hiltzick, *Column: Rich Farmers, Not Mom-and-Pop Farms, Will Collect Most of Trump's Tariff Bailout*, L.A. TIMES (May 28, 2019), https://www.latimes.com/business/hiltzik/la-fi-hiltzik-trump-farm-bailout-20190528-story.html.

35. Emma Schmidt, *We're Suing Iowa for Choosing Big Ag Over Clean Water*, FOOD & WATER WATCH (Oct. 4, 2019), https://foodandwaterwatch.org/news/suing-iowa-for-choosing-big-ag-over-clean-water.

36. David Pitt, *Groups Sue Iowa for Farm Pollution into Raccoon River*, ASSOCIATED PRESS (Mar. 27, 2019), https://apnews.com/6d0e70dc7adf4e929a7dbcde5e0eb8e3.

37. Anna O'Connor, *Fence Row to Fence Row: An Examination of Federal Commodity Subsidies*, 21 KAN. J.L. & PUB. POL'Y 432, 433 (2012).

ways.[38] This pollution is wreaking havoc on water sources throughout the United States, creating areas in bodies of water that are the size of multiple states in which living organisms cannot exist,[39] causing harmful health effects,[40] and devastating local economies.[41] This could be just the beginning.

Agricultural pollution stems from many sources, including fertilizers and pesticides, animal excrement from livestock operations, and sediment loading from timber operations.[42] These pollutants add "ammonium, nitrates, nitrites, and phosphorous to ambient water quality[, causing d]ownstream lakes and reservoirs [to] experience eutrophication, algae blooms, and depleted oxygen, while rivers can be impacted by excessive salinity, turbidity (from sediment), and toxicity, resulting in forever-altered marine ecosystems."[43]

The negative impact and financial burden of agriculture's water pollution on society are well-documented.[44] Yet, legislation continues to largely exempt agriculture from environmental regulation and allows it to externalize many of its costs. Regulators ostensibly provide such special treatment to agriculture to ensure its continued financial health, which in turn arguably ensures that cheap food is readily available for the country.[45] But such special treatment decreases water quality, as the environmental regulatory exemptions provided to the industry allow it to pollute water sources.[46]

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38. Negowetti, *supra* note 16, at 455; Michael Steeves, *The EPA's Proposed CAFO Regulations Fall Short of Ensuring the Integrity of Our Nation's Waters*, 22 J. LAND RES. & ENVTL. L. 367, 372 (2002); *see generally* Martin et al., *infra* note 136 (discussing how antibiotic overuse in animals leads to antibiotic resistance in humans).

39. Ben Sherman, *2015 Gulf of Mexico Dead Zone 'Above Average'*, NAT'L OCEANIC AND ATMOSPHERIC ADMIN. (Aug. 4, 2015), https://www.noaa.gov/media-release/2015-gulf-of-mexico-dead-zone-above-average (explaining that the size of the Gulf of Mexico dead zone in 2015 was approximately the size of Connecticut and Rhode Island combined).

40. Negowetti, *supra* note 16, at 454–55.

41. Michael Wines, *Spring Rain, Then Foul Algae in Ailing Lake Erie*, N.Y. TIMES (Mar. 14, 2013), http://www.nytimes.com/2013/03/15/science/earth/algae-blooms-threaten-lake-erie.html (discussing the decrease in tourists and tourism revenue for the region surrounding Lake Erie); *Great Lakes Restoration Initiative*, USDA (Dec. 2014), https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1266586.pdf; Timothy Dean, *Chesapeake Bay's Decline Endangers Watermen's Livelihoods*, BALT. SUN (Mar. 21, 2019), https://www.baltimoresun.com/news/opinion/oped/bs-ed-op-0322-watermen-bay-20190319-story.html.

42. Jan G. Laitos & Heidi Ruckriegle, *The Clean Water Act and the Challenge of Agricultural Pollution*, 37 VT. L. REV. 1033, 1033 (2013) ("There are many sources of agricultural pollution, including fertilizers and pesticides applied to row fields, animal waste from livestock operations, and sediment loading from tree farms.").

43. *Id.*

44. *See, e.g.*, 2018 UN REPORT ON AGRICULTURE, *supra* note 18, at 6 (citing Daniel J. Sobota et al., *Cost of Reactive Nitrogen Release from Human Activities to the Environment in the United States*, 2015 ENV'T RESPONSE LETTERS 10, Feb. 2015, *available at* https://iopscience.iop.org/article/10.1088/1748-9326/10/2/025006/meta).

45. *See* Negowetti, *supra* note 16, at 458, 464–65.

46. *See* JAVIER MATEO-SAGASTA ET AL., UNITED NATIONS FOOD AND AGRIC. ORG., WATER POLLUTION FROM AGRICULTURE: A GLOBAL REVIEW 2 (2017) (citing *Water Quality Assessment and TMDL Information*, ENV'T PROT. AGENCY (2016), https://ofmpub.epa.gov/waters10/attains_index.home) [hereinafter 2017 UN REPORT ON AGRICULTURE] ("In the United States of America, agriculture is the main source of pollution in rivers and streams, the second main source in wetlands and the third main source in lakes.") (citation omitted).

Many economic and environmental experts disagree that providing regulatory exemptions and allowing the industry to externalize its costs improves the health of the industry.[47] Specifically, two leading economists and business experts, Michael Porter and Claas van der Linde, developed a theory that regulation can encourage innovation and competition within an industry.[48] Regulation can cause innovation by providing the needed incentive to invest in new technology.[49]

Specifically, by no longer exempting the agriculture industry from environmental regulations and forcing the industry to be responsible for the costs of its pollution, regulation would incentivize innovation.[50] Moreover, according to this theory, those innovations often become a net-positive for the industry because the added revenue or cost saved from the innovation is greater than the compliance cost.[51] The Porter Hypothesis theorizes that environmental regulation causes two types of innovation.[52] The key to the first type of innovation lies in converting the resources left over from the polluting activity into something of value.[53] The second type of innovation involves improving resource productivity by substituting less environmentally costly materials or better utilizing existing ones.[54]

The Porter Hypothesis also posits that environmental regulation improves the competitiveness of the regulated industry.[55] Increased competitiveness results from firms increasing the efficiency of resources used in the production process and from increasing product quality.[56] Increasing the resource efficiency of production involves decreasing the utilization of harmful resources.[57] Due to the new regulation, the decrease in utilization of harmful resources decreases costs[58] while also improving the company's

47. *Compare* Porter & van der Linde, *A New Conception*, *supra* note 12 (positing regulation can encourage innovation and competition within an industry), *with* Michael A. Livermore, *The Meaning of Green Growth*, 3 MICH. J. ENV'T & ADMIN. L. 33, 56 (2013) ("[S]ome economists are uncomfortable with the Porter hypothesis's claim that profit maximizing firms fail to take advantage of productivity increasing innovations, which seems to conflict with economic rationality.").

48. *See generally* Porter & van der Linde, *A New Conception*, *supra* note 12.

49. Nicholas A. Ashford & Ralph P. Hall, *The Importance of Regulation-Induced Innovation for Sustainable Development*, 3 SUSTAINABILITY 270, 277 (2011).

50. *See generally* Porter & van der Linde, *A New Conception*, *supra* note 12.

51. *Id.* at 98.

52. Michael E. Porter & Claas van der Linde, *Green and Competitive: Ending the Stalemate*, HARV. BUS. REV. 120, 125–26 (1995) [hereinafter Porter & van der Linde, *Green and Competitive*].

53. *Id.* at 125.

54. *Id.*

55. Porter & van der Linde, *A New Conception*, *supra* note 12, at 98.

56. LUKE A. STEWART, INFO. TECH. & INNOVATION FOUND., THE IMPACT OF REGULATION ON INNOVATION IN THE UNITED STATES: A CROSS-INDUSTRY LITERATURE REVIEW 1, 8 (2010), https://www.itif.org/files/2011-impact-regulation-innovation.pdf.

57. *See* Porter & van der Linde, *A New Conception*, *supra* note 12, at 101.

58. Porter & van der Linde, *Green and Competitive*, *supra* note 52, at 120, 133.

competitiveness in the marketplace.[59] Increasing product quality also results from reducing the negative environmental impact of those products.[60] As global demand has shifted towards green products, so has the desirability of environmentally friendly products, meaning that reducing producers' negative environmental impact actually increases their perceived quality in the marketplace.[61] Improving both resource efficiency and product quality in turn promotes a market where firms compete to produce the most desirable environmentally friendly products.[62] Overall, this kind of increased innovation and competition would likely result in a higher national water quality, less burdensome financial costs to society, and healthier people.[63]

Part I of this Article explains the societal harms that agriculture's water pollution causes, including the negative financial ramifications and harms to human health. Part II examines the monetary and legal benefits policymakers exclusively provide to the agriculture industry. Part III considers the negative impact of agricultural exceptionalism on innovation and competition within the agriculture industry. This Part also analyzes the improvement that would result if policymakers curtailed agricultural exceptionalism. Part IV considers various solutions for limiting agricultural exceptionalism. A final Part briefly concludes.

I. THE PROBLEMS CAUSED BY AGRICULTURE'S WATER POLLUTION

A. Water Degradation

The production processes utilized by conventional agriculture "contribute various pollutants to surface water, including nutrients, pesticides, and sediments."[64] Conventional agriculture, as used in this Article, is defined by the use of synthetic inputs like chemical fertilizers, pesticides, and herbicides.

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59. *Id.* at 120 ("Ultimately, this enhanced *resource productivity* makes companies more competitive, not less.").

60. *Id.* at 133; Porter & van der Linde, *A New Conception*, *supra* note 12, at 101.

61. *See Was 2018 the Year of the Influential Sustainable Consumer?*, NIELSON (Dec. 17, 2018), https://nielseniq.com/global/en/insights/analysis/2018/was-2018-the-year-of-the-influential-sustainable-consumer ("Nearly half (48%) of U.S. consumers say they would definitely or probably change their consumption habits to reduce their impact on the environment. And these consumers are putting their dollars where their values are, spending $128.5 billion on sustainable fast-moving consumer goods (FMCG) products this year.") (footnote omitted). *But see* Katherine White et al., *The Elusive Green Consumer*, HARV. BUS. REV., JULY–AUG. 2019, at 124, 127 ("Few consumers who report positive attitudes toward eco-friendly products and services follow through with their wallets. In one recent survey 65% said they want to buy purpose-driven brands that advocate sustainability, yet only about 26% actually do so.").

62. *See* Porter & van der Linde, *Green and Competitive*, *supra* note 52, at 133 ("Resisting innovation that reduces pollution . . . will lead not only to environmental damage but also to the loss of competitiveness in the global economy.").

63. *Id.* at 125 (using data from collaborative research to show that "the costs of addressing environmental regulations can be minimized, if not eliminated, through innovation that delivers other competitive benefits").

64. Negowetti, *supra* note 16, at 453.

Conventional farmers use chemical fertilizers and manure to boost crop growth, but crops cannot utilize all of the fertilizer and manure applied.[65] Thus, when farmland is saturated by rainfall, irrigation, flooding, or snowmelt, unused fertilizer and manure are carried to surface water and groundwater.[66] The surface runoff from farmlands "carries manure, fertilizers, and pesticides into streams, lakes, and reservoirs, often causing unacceptable levels of bacteria, nutrients, or synthetic organic compounds."[67]

Testing of water in the United States verifies that runoff from agriculture is a serious problem[68] and that "[s]ediments from U.S. waterways are often heavily contaminated."[69] Testing for pesticides in water has been limited, yet, nearly half of states have reported its groundwater contains at least one agriculture-related pesticide.[70] Further, a study by the U.S. Geological Survey "found one or more pesticide compounds in over [40%] of [untreated groundwater] samples."[71] It is no surprise then that "even the EPA concedes that runoff from agricultural activities is the primary culprit for 48% of the 'impaired' waters in the United States."[72] In California, the runoff problem is even worse as agricultural pollutants comprise approximately 75% of all water impairment.[73]

Commodity crop production also results in soil erosion that contributes to increased water pollution.[74] Agricultural exceptionalism policies encourage farmers to maximize their production of commodity crops so that they can receive more commodity subsidy payments.[75] As a result, commodity crops, such as corn, soybeans, and other subsidized annual crops, "are often grown without rotating in other crops that can prevent erosion and replace vital nutrients in the soil."[76] This failure to take preventative measures likely causes

65. *Id.*

66. *Id.* at 453–54.

67. *Id.* at 453.

68. J.B. Ruhl, *Farms, Their Environmental Harms, and Environmental Law*, 27 ECOLOGY L.Q. 263, 290–91 (2000). As Professor Ruhl explains:

> Overall, runoff of topsoil, silt, sediment, manure, nutrients, chemicals, and other pollutants from agricultural nonpoint sources is the leading source of impairment in the Nation's rivers, affecting 60% of the impaired river miles. Agriculture is the leading source of impairment in lakes as well, affecting 50% of impaired lake acres, or 2 million lake acres. Agriculture also pollutes 34% of impaired estuarine waters. Groundwater, on which half of the U.S. population and most rural communities depend, is also substantially threatened from polluted farm runoff.

Id. (footnotes omitted).

69. Negowetti, *supra* note 16, at 455.

70. *Id.*

71. *Id.*

72. Laitos & Ruckriegle, *supra* note 42, at 1045 (citing U.S. ENV'T PROT. AGENCY, NATIONAL WATER QUALITY INVENTORY: 2000 REPORT 15 (2002)).

73. Margot J. Pollans, *Drinking Water Protection and Agricultural Exceptionalism*, 77 OHIO ST. L.J. 1195, 1208 (2016).

74. Negowetti, *supra* note 16, at 451.

75. *Id.* at 451–52.

76. *Id.*

more erosion.[77] Soil erosion is an environmental hazard because eroded soil contains nutrients and other pollutants that can impair water quality to a significant degree.[78]

The agriculture industry's approach to raising animals has drastically changed over the past several decades,[79] and that change has harmed overall water quality.[80] Factory farms with animals crowded into large warehouse-type structures have replaced small-scale, diversified farms.[81] These industrial factory farms, called Concentrated Animal Feeding Operations (CAFOs), aim to produce mass amounts of cheap meat as quickly as possible.[82] These "CAFOs use . . . mechanized feeding and water practices, genetic selection, antibiotics, and growth hormones to produce more meat faster, using less acreage and less human labor than traditional farms."[83] This mass production of cheap meats carries a great long-term cost because CAFOs are a significant water pollution source in the United States.[84]

Manure from CAFOs is a major source of water pollution.[85] Manure can fertilize crops if managed and applied properly,[86] but CAFOs routinely fail to implement proper manure management procedures that prevent water pollution.[87] When animals are raised outdoors and are housed less densely than in typical CAFO housing structures, they excrete their manure directly onto the land, which then fertilizes the soil.[88] On the other hand, CAFOs often keep

77. *Id.*; *see also* 2018 UN REPORT ON AGRICULTURE, *supra* note 18, at 182 (discussing good farming practices to maintain soil fertility and prevent erosion).

78. Negowetti, *supra* note 16, at 452.

79. Christopher R. Brown, *When the "Plain Text" Isn't So Plain: How* National Pork Producers Council *Restricts the Clean Water Act's Purpose and Impairs Its Enforcement Against Factory Farms*, 16 DRAKE J. AGRIC. L. 375, 387 (2011).

80. JoAnn Burkholder et al., *Impacts of Waste from Concentrated Animal Feeding Operations on Water Quality*, 115 ENV'T HEALTH PERSP. 308, 308 (2007); *see also* Georgina Gustin, *Factory Farms Get Bigger, Pollution Grows, but Regulators Don't Even Know Where They Are*, INSIDE CLIMATE NEWS (Oct. 21, 2016), https://insideclimatenews.org/news/21102016/cafo-epa-regulations-factor-farms-get-bigger-pollution-grows-environmental-impact-methane (discussing the water pollution problems presented by CAFOs).

81. Hannah Connor, *Comprehensive Regulatory Review: Concentrated Animal Feeding Operations Under the Clean Water Act from 1972 to the Present*, 12 VT. J. ENV'T L. 275, 276–77 (2011); Steeves, *supra* note 38, at 367.

82. *See* Michelle B. Nowlin, *Sustainable Production of Swine: Putting Lipstick on a Pig?*, 37 VT. L. REV. 1079, 1084 (2013).

83. Emily Kenyon, Note, *Enough of this Manure: Why the EPA Needs to Define the Agricultural Stormwater Exemption to Limit the "Runoff" from the* Alt *Court*, 92 N.Y.U. L. REV. 1187, 1188–89 (2017).

84. Ruhl, *supra* note 68, at 290 ("Animal waste is another major component of farm runoff, accounting for one-third of all water impairments attributable to agriculture.") (citing Larry C. Frarey & Staci J. Pratt, *Environmental Regulation of Livestock Production Operations*, ABA NAT. RES. & ENV'T, WINTER 1995, at 8); Sarah A. Matsumoto, *Citizens of Washington State Work to Fill Gaps in Regulation of Surface and Groundwater Pollution from CAFOs*, ABA NAT. RES. & ENV'T, Spring 2019, at 26.

85. *See* sources cited *supra* note 84.

86. Kenyon, *supra* note 83, at 1189.

87. *Id.* at 1190; Ruhl, *supra* note 68, at 317.

88. Moises Velasquez-Manoff, *Can Dirt Save the Earth?*, N.Y. TIMES (Apr. 18, 2018), https://www.nytimes.com/2018/04/18/magazine/dirt-save-earth-carbon-farming-climate-change.html.

their animals inside and buy feed instead of growing crops.[89] The concentration of a high number of animals on a small amount of land results in many CAFOs producing more manure than their crops need, assuming they even have crops.[90] Consequently, most CAFOs store their manure in massive lagoons.[91]

Eventually, CAFOs apply the manure to spray fields.[92] Spray fields are crop fields or empty fields where operators spray manure to fertilize soil or simply to dispose of the manure.[93] Like fertilizer and pesticide runoff,[94] when too much manure is applied or it is applied improperly, the soil is unable to absorb all the nutrients in the manure, and water runoff then carries the manure to surface water or groundwater.[95] Therefore, it is no surprise that manure from CAFOs routinely infects U.S. water systems through surface runoff, as well as direct discharges, leaching, and erosion.[96] The pollutants from CAFO manure not only impair water quality but also harm aquatic ecosystems, disrupt local economies, and create serious health issues.[97]

B. Dead Zones

Agriculture's excess fertilizers, manure, and other pollutants can cause serious and expansive damage to marine life, commercial fisheries, and tourism by creating "dead zones."[98] "A dead zone is an area of depleted oxygen that kills and displaces fish and marine life and is caused primarily by nutrient (mainly nitrogen and phosphorus) runoff from agriculture and other human activities."[99] Dead zones have formed in various regions across the United

89. Kenyon, *supra* note 83, at 1189.

90. *Id.*; Brown, *supra* note 79, at 387.

91. Kenyon, *supra* note 83, at 1190; Kristen E. Mollnow, Note, Concerned Area Residents for the Environment v. Southview Farm*: Just What Is a Concentrated Animal Feeding Operation Under the Clean Water Act?*, 60 ALB. L. REV. 239, 241 (1996).

92. Connor, *supra* note 81, at 279 (citing U.S. GOV'T ACCOUNT. OFF., GAO-08-944, CONCENTRATED ANIMAL FEEDING OPERATION: EPA NEEDS MORE INFORMATION AND A CLEARLY DEFINED STRATEGY TO PROTECT AIR AND WATER QUALITY FROM POLLUTANTS OF CONCERN 1, 1 (2008)).

93. Kenyon, *supra* note 83, at 1190.

94. Negowetti, *supra* note 16, at 453.

95. Connor, *supra* note 81, at 280.

96. Ruhl, *supra* note 68, at 290 (citing Larry C. Frarey & Staci J. Pratt, *Environmental Regulation of Livestock Production Operations*, ABA NAT. RES. & ENV'T, WINTER 1995, at 8) ("Animal waste is another major component of farm runoff, accounting for one-third of all water impairments attributable to agriculture."); Kenyon, *supra* note 83, at 1190.

97. Kenyon, *supra* note 83, at 1190–91.

98. Negowetti, *supra* note 16, at 454.

99. Amanda L. Crawford, Comment, *Nutrient Pollution and the Gulf of Mexico Dead Zone: Will Des Moines Water Works Be a Turning Point?*, 91 TUL. L. REV. 157, 158 (2016). Other factors contributing to the Dead Zone include sewage disposal, industrial emissions, artificial drainage systems, and destruction of wetlands. *See* Eileen McLellan, *Fertilizer Runoff Is Just One Piece of the Dead Zone Puzzle*, ENV'T DEF. FUND (Oct. 21, 2015), http://blogs.edf.org/growingreturns/2015/10/21/fertilizer-runoff-is-just-one-piece-of-the-dead-zone-puzzle; Roddy Scheer & Doug Moss, *What Causes Ocean "Dead Zones"?*, SCI. AM. (Sept. 25, 2012), http://www.scientificamerican.com/article/ocean-dead-zones.

States.[100] These dead zones often occur when nutrients from agriculture production cause growth of algal blooms.[101] Then, "[a]s the algae dies, it takes oxygen out of the water."[102] Therefore, more algae means that "less oxygen is available for phytoplankton and other organisms in the aquatic ecosystem, causing hypoxia, or a shortage of oxygen."[103] A hypoxic area rapidly transforms into a dead zone because mobile organisms, like fish, move out of the area while immobile organisms die, eventually causing a collapse in the food chain.[104]

Manure from CAFOs specifically harms aquatic ecosystems because high concentrations of nitrogen and phosphorus in the manure cause algal blooms to grow.[105] Because of that growth, the "[a]lgal blooms kill aquatic life by blocking sun light [sic], reducing dissolved oxygen, raising pH levels, and producing toxic microorganisms."[106] Toxic microorganisms are specifically linked to massive numbers of fish dying.[107] For example, 30,000 fish died in Chesapeake Bay due to an outbreak of one toxic microorganism.[108]

The dead zone in the Gulf of Mexico is the largest example of hypoxia in the United States[109] and the second-largest current example of hypoxia in the world;[110] however, many others exist.[111] The dead zone in the Gulf "is largely the result of commodity crop production and fertilizer application in the U.S. Corn Belt close to the Mississippi River and other rivers."[112] Research from one

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100. *See What is a Dead Zone?*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (last updated Dec. 20, 2020), https://oceanservice.noaa.gov/facts/deadzone.html ("Dead zones occur in coastal areas around the nation and in the Great Lakes—no part of the country or the world is immune.").

101. Negowetti, *supra* note 16, at 454.

102. *Id.*

103. *Id.*

104. *Id.*

105. Kenyon, *supra* note 83, at 1190–91.

106. *Id.* at 1191 (internal quotation omitted); *see* ENV'T PROT. AGENCY, MISSISSIPPI RIVER/GULF OF MEXICO NUTRIENT TASK FORCE, 2017 REPORT TO CONGRESS 1, 5 (2017), https://www.epa.gov/sites/production/files/2017-11/documents/hypoxia_task_force_report_to_congress_2017_final.pdf ("This stratification of the water column restricts the mixing of oxygen-rich surface water with oxygen-poor deep water. Furthermore, the excessive nutrient loads trigger an overgrowth of algae that rapidly consumes oxygen as it decomposes.").

107. Ruhl, *supra* note 68, at 290 ("*Pfiesteria piscicida* . . . has been implicated in massive fish kills in rivers leading to the Chesapeake Bay and other . . . estuaries, forcing the closing of many rivers to commercial and recreational uses. . . . [T]he *Pfiesteria piscicida* outbreaks are correlated with increased nitrate levels in rivers caused by chicken waste . . . .") (footnote omitted).

108. Steeves, *supra* note 38, at 370 ("In 1997, Pfiesteria piscicada was responsible for the death of over 30,000 fish in Chesapeake Bay.").

109. *See* Negowetti, *supra* note 16, at 454.

110. *See* Jenny Howard, *Dead Zones, Explained*, NAT'L GEOGRAPHIC (last updated Aug. 1, 2019), https://www.nationalgeographic.com/environment/oceans/dead-zones ("The largest dead zone in the world lies in the Arabian Sea, covering almost the entire 63,700-square mile Gulf of Oman."); *id.* (citing *Scientists Confirm Florida-Sized Dead Zone in the Gulf of Oman*, YALE ENV'T 360 (Apr. 30, 2018), https://e360.yale.edu/digest/scientists-confirm-florida-sized-dead-zone-in-the-gulf-of-oman).

111. Howard, *supra* note 110 ("A 2008 study found more than 400 dead zones exist worldwide—anywhere excess nutrients travel downstream and into a body of water.") (citing Robert J. Diaz and Rutger Rosenberg, *Spreading Dead Zones and Consequences for Marine Ecosystems*, 321 SCI. MAG. 926, 926–29 (2008))

112. Negowetti, *supra* note 16, at 454.

federal agency indicates that certain agriculture practices that result in runoff of fertilizers and manure "contribute to over sixty percent of the nitrogen and over forty percent of the phosphorus affecting the Gulf of Mexico."[113] In 2015, this dead zone was larger than Connecticut and Rhode Island combined.[114]

One of the first dead zones discovered in the United States was in the Chesapeake Bay.[115] That region is still dealing with a dead zone[116] mainly caused by nutrient pollution,[117] which is "the process where too many nutrients, mainly nitrogen and phosphorus, are added to bodies of water and can act like fertilizer, causing excessive growth of algae."[118] The dead zone became such an issue that President Obama issued an executive order calling for several states and federal agencies to work together to develop a plan to protect and restore it.[119] Florida also has a history of nutrient pollution and algae blooms causing issues in its waterways.[120] This pollution has led to numerous disputes including a lawsuit filed by the U.S. government against the state of Florida because of its insufficient efforts in dealing with the pollution.[121]

Lake Erie has also dealt with excessive nutrient pollution.[122] In fact, in 2011, Lake Erie contained the largest algal bloom ever recorded.[123] Moreover, dissolved phosphorus fertilizers and climate change caused these water quality issues.[124] One algal bloom became such an issue in this region in 2014 that it forced the city of Toledo to shut off drinking water for its 500,000 residents.[125]

Algal blooms, and resulting dead zones, can wreak havoc on neighboring communities. Dead zones often cause financial harm because of their negative impact on tourism and their capacity to kill fish, then diminishing the livelihoods of local fishermen.[126] For example, "[t]he Chesapeake Bay's crab

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113. *Id.*

114. *2015 Gulf of Mexico Dead Zone "Above Average",* NAT'L OCEANIC AND ATMOSPHERIC ADMIN., (Aug. 4, 2015), https://www.noaa.gov/media-release/2015-gulf-of-mexico-dead-zone-above-average.

115. Crawford, *supra* note 99, at 169 (citing *Dead Zone*, NAT'L GEOGRAPHIC, http://nationalgeographic.org/encyclopedia/dead-zone/ (last visited Dec. 27, 2019)).

116. *Id.*

117. *Id.*

118. *What is Nutrient Pollution?*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., (last updated Dec. 4, 2020), https://oceanservice.noaa.gov/facts/nutpollution.html.

119. Crawford, *supra* note 99, at 169–70 (citing Exec. Order No. 13,508, 74 Fed. Reg. 23,099 (May 12, 2009)).

120. *Id.* at 171–72.

121. *Id.* (citing United States v. S. Fla. Water Mgmt. Dist., 847 F. Supp. 1567, 1569 (S.D. Fla. 1992), *rev'd in part*, 28 F.3d 1563 (11th Cir. 1994)).

122. Martha L. Noble, *Update: Lake Erie Nutrient Pollution - Agriculture and Drinking Water*, ABA AGRIC. MGMT. COMM. NEWSL., November 2016, at 20.

123. Crawford, *supra* note 99, at 174.

124. *Id.* at 174–75.

125. *Id.* at 174.

126. Pollans, *supra* note 73, at 1209; *see also* Darryl Fears & Lori Rozsa, *Florida's Unusually Long Red Tide is Killing Wildlife, Tourism and Businesses*, WASH. POST (Aug. 28, 2018), https://www.washingtonpost.com/national/health-science/floridas-unusually-long-red-tide-is-killing-wildlife-tourism-and-businesses/2018/08

industry, previously worth roughly fifty-two million dollars, shrunk drastically due to the decline in water quality."[127] One study concluded that if the Chesapeake Bay area experienced just a 25% increase in dissolved oxygen levels, the catch rates would improve by 20% and would result in annual financial benefits of over $80 million.[128] Due to eutrophication, dead zones are also frequently associated with cloudiness and surface plant accumulation,[129] both of which can reduce the recreational value of a body of water.[130] The unappealing sight of a dead zone alone can decrease tourism dollars.[131]

C. Health Consequences

The runoff of various pollutants from agriculture also implicates human health concerns.[132] Water pollution from agriculture is linked to increased incidences of many serious medical issues including the following: methemoglobinemia,[133] organ cancer, [134] skin cancer,[135] and antibiotic resistance.[136] Additionally, agriculture pollution is often associated with negative effects on respiratory, digestive, nervous, and cutaneous systems.[137] The symptoms can range from headaches, fever, muscle and joint pain, stomach cramps, vomiting, diarrhea, liver failure, seizures, and respiratory arrest.[138]

Pesticides used in agriculture are of especial concern because they are highly water-soluble and "may impair drinking water sources when they leach into ground water."[139] Additionally, nitrogen runoff from commodity crops is linked

/28/245fc8da-aad5-11e8-8a0c-70b618c98d3c_story.html?noredirect=on&utm_term=.2354d145a352; Steve Schultz, *Industrial Ag Pollution Threatens Minnesota Lakes and Rivers*, MINN. POST (Mar. 26, 2019), https://www.minnpost.com/community-voices/2019/03/industrial-ag-pollution-threatens-minnesota-lakes-and-rivers; Timothy Dean, *Chesapeake Bay's Decline Endangers Watermen's Livelihoods*, BALT. SUN (Mar. 21, 2019), https://www.baltimoresun.com/news/opinion/oped/bs-ed-op-0322-watermen-bay-20190319-story.html.

127. Kenyon, *supra* note 83, at 1191 (footnote omitted).

128. S.S. Rabotyagov et al., *The Economics of Dead Zones: Causes, Impacts, Policy Challenges, and a Model of the Gulf of Mexico Hypoxic Zone*, 8 REV. ENV'T ECON. & POL'Y 58, 65 (2014).

129. Pollans, *supra* note 73, at 1209.

130. *Id.*

131. *Id.*; *see generally* Fears & Rozsa, *supra* note 126.

132. Negowetti, *supra* note 16, at 454. *But see* Shawn Waliser, *Another Tragedy of the Commons: Placing Cost Where It Belongs by Banning Hazardous Substances in Fertilizer Through State Legislation*, 18 J. ENV'T L. & LITIG. 51, 87–88 (2003).

133. Negowetti, *supra* note 16, at 455.

134. Steeves, *supra* note 38, at 372.

135. *Id.*

136. *See generally* Michael J. Martin et al., Editorial, *Antibiotics Overuse in Animal Agriculture: A Call to Action for Health Care Providers*, 105 AM. J. PUB. HEALTH 2409 (2015), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4638249/pdf/AJPH.2015.302870.pdf.

137. Pollans, *supra* note 73, at 1209.

138. *Id.*

139. Negowetti, *supra* note 16, at 455.

to harming human health.[140] Methemoglobinemia, more commonly known as blue baby syndrome, which can be fatal,[141] and other adverse reproductive outcomes are among the health risks of nitrogen runoff.[142]

CAFO water pollution in particular is linked to several serious health issues and can even lead to death.[143] Consuming water with elevated levels of arsenic, which is found in CAFO manure, is associated with higher incidences of organ and skin cancer.[144] Moreover, consumption of water contaminated with high levels of manure can cause consumers to develop resistance to antibiotics.[145] There is increasing evidence that human antibiotic resistance is "promoted by the widespread use of nontherapeutic antibiotics in animals."[146] In fact, acquisition of methicillin-resistant Staphylococcus aureus, better known as MRSA, an antibiotic-resistant bacteria that can lead to death, is linked to living near spray fields.[147] In Wisconsin, a pathogen associated with runoff from a herd of cows caused over 400,000 people to get sick and killed more than 100 people.[148]

The eutrophication that occurs in dead zones also poses significant health risks.[149] Contaminants from eutrophication can enter a water system at levels exceeding the filtration and treatment ability of local water utilities.[150] "Certain species of algae, cyanobacteria or blue-green algae, can produce a variety of toxins that can affect respiratory, digestive, nervous, and cutaneous systems."[151] Severe side effects can include respiratory arrest, seizures, and liver failure.[152] Less severe symptoms can include fever, muscle and joint pain, vomiting, diarrhea, stomach cramps, and headaches.[153]

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140. *Id.*

141. *Potential Well Water Contaminants and Their Impacts*, ENV'T PROT. AGENCY, https://www.epa.gov/privatewells/potential-well-water-contaminants-and-their-impacts (last updated Jan. 7, 2021).

142. *See* 2018 UN REPORT ON AGRICULTURE, *supra* note 18, at 5–6; Negowetti, *supra* note 16, at 455.

143. *See* CARRIE HRIBAR, NAT'L ASSOC. OF LOCAL BDS. OF HEALTH, UNDERSTANDING CONCENTRATED ANIMAL FEEDING OPERATIONS AND THEIR IMPACT ON COMMUNITIES 6–10 (2010), https://www.cdc.gov/nceh/ehs/docs/understanding_cafos_nalboh.pdf.

144. Steeves, *supra* note 38, at 372 (discussing the effects of drinking water with increased levels of pollutants from CAFO waster including "incidences of skin and organ cancer.").

145. *See Antibiotic Resistance and NARMS Surveillance*, CTRS. FOR DISEASE CONTROL & PREVENTION (last updated Nov. 21, 2019), https://www.cdc.gov/narms/faq.html.

146. Martin et al., *supra* note 136, at 2409.

147. Kenyon, *supra* note 83, at 1192; *see also* Martin et al., *supra* note 136, at 2409.

148. Kenyon, *supra* note 83, at 1191–92 n.24 (citing to Theresa Heil, *Agricultural Nonpoint Source Runoff - The Effects Both on and off the Farm: An Analysis of Federal and State Regulation of Agricultural Nonpoint Source Pollutants*, 5 WIS. ENV'T L.J. 43, 45 (1998)).

149. Pollans, *supra* note 73, at 1209; *see Algal Blooms*, NAT'L INST. OF ENV'T HEALTH SCI., https://www.niehs.nih.gov/health/topics/agents/algal-blooms/index.cfm (last updated Jan. 21, 2021) ("In animals, scientists have observed that chronic, low level exposure to [one algae bloom toxin] altered the expression of genes controlling the nervous system and impaired cell function.").

150. Pollans, *supra* note 73, at 1209–10.

151. *Id.* at 1209; *see Algal Blooms*, *supra* note 149.

152. Pollans, *supra* note 73, at 1209.

153. *Id.*

D. The Financial Impact of Water Pollution

Water pollution from conventional agriculture causes significant costs, costs for which the industry is largely insulated from paying.[154] Instead, individuals and non-agricultural businesses, as well as local, state, and federal governments, are saddled with them.[155] These costs include additional filtration costs and increased healthcare costs.[156] Conventional agriculture's water pollution can also cause employees to miss work due to illness, which has a negative financial impact on both the employee and the employer.[157] Moreover, many industries are reliant on clean water for their business, so water pollution from conventional agriculture can actually decrease their profits.[158] The focus of this Part is not to conduct an in-depth analysis of agriculture's national economic impact but rather to discuss and analyze the financial burden conventional agriculture's water pollution places on society by externalizing its costs.

1. Treatment and Filtration Costs

Water pollution from agriculture contains several pollutants that cause public health concerns and increase the costs of delivering safe water to citizens.[159] The majority of money used to treat water is local money.[160] "On average, states and localities contribute 65% of the funding and the federal government contributes the remaining 35%."[161] And "cleanup responsibility and costs [for treating drinking water] are expressly allocated, under federal law, to public water utilities."[162]

Although the source of funding is mostly local, the source of the pollution often is not.[163] "For instance, manure runoff in the upper Mississippi River basin, coming from farms in Wisconsin and Minnesota, can end up in the Gulf of Mexico, well over a thousand miles away."[164] Moreover, "[o]ne study

154. *See* 2018 UN REPORT ON AGRICULTURE, *supra* note 18, at 5–6.

155. *Id.*

156. *Id.* at 120.

157. *See* discussion *infra* Part I.D.4.

158. *See* AM. SUSTAINABLE BUS. COUNCIL, NATIONAL POLL: SMALL BUSINESS OWNERS FAVOR REGULATIONS TO PROTECT CLEAN WATER 1 (2014), https://www.asbcouncil.org/sites/main/files/file-attachments/asbc_clean_water_poll_report_july2014_sv_final_140721v2sm.pdf?1546454951; Andrew Clarke, *Businesses Depend on Strong Clean-Water Rules*, CHI. TRIB. (Oct. 1, 2015), http://www.chicagotribune.com/suburbs/daily-southtown/opinion/ct-sta-clean-water-commentary-st-0925-20151001-story.html.

159. Pollans, *supra* note 73, at 1205.

160. *Id.* at 1207; *see also* Negowetti, *supra* note 16, at 467 ("As nutrient pollution has worsened, installation of expensive drinking water treatment equipment has become increasingly necessary across the country.").

161. Pollans, *supra* note 73, at 1207 n.63.

162. *Id.* at 1214.

163. *Id.* at 1208.

164. *Id.*

estimated that as much as 15% of nitrogen fertilizer and 3% of the pesticides applied to cropland throughout the Mississippi River Basin end up in the Gulf [of Mexico]."[165] Therefore, many water systems and individuals are likely forced to pay more to filter and treat their water from agriculture pollution that does not occur in their locality, region, or state.

The EPA estimates that nonpoint source water pollution alone,[166] to which conventional agriculture is a major contributor,[167] results in approximately $21 billion in annual costs for drinking water systems.[168] It also estimates that for water systems serving less than 500 people, responding to nitrate contamination alone would require approximately $280,000 in capital investment and $17,500 in annual operating expense.[169] "For larger systems serving up to 3,300 people, the capital cost could exceed a half million, and the operating costs could exceed $50,000."[170] Costs to individuals to avoid consuming contaminated water, which typically include purchasing bottled water and installing household level filtration systems, are estimated to be expensive.[171] One study of the United States estimated that each year individuals spend $942 million to purchase bottled water to avoid water contamination.[172]

While few comprehensive studies of these costs exist,[173] there are several examples of the cost to local governments from treating water polluted by agriculture. For example, five municipalities in Minnesota had to install nitrate filtration equipment due to nitrate contamination.[174] The Minnesota Department of Agriculture concluded that the construction costs alone ranged from $350 to $970 per resident.[175] Meanwhile, "[i]n its complaint against neighboring irrigation districts, the City of Des Moines' Water Works estimates

165. *Id.*

166. *Basic Information About Nonpoint Source (NPS) Pollution*, ENV'T PROT. AGENCY, https://www.epa.gov/nps/basic-information-about-nonpoint-source-nps-pollution (last updated Oct. 7, 2020) (differentiating nonpoint source pollution as any source of water pollution that does not come from a "point source" like a ditch, pipe, or channel, and usually stems from land runoff from precipitation moving over the ground).

167. *Nonpoint Source: Agriculture*, ENV'T PROT. AGENCY (last updated Jan. 4, 2021), https://www.epa.gov/nps/nonpoint-source-agriculture ("The National Water Quality Assessment shows that agricultural runoff is the leading cause of water quality impacts to rivers and streams, the third leading source for lakes, and the second largest source of impairments to wetlands.").

168. Pollans, *supra* note 73, at 1221.

169. *Id.* at 1222.

170. *Id.* at 1222–23.

171. *Id.* at 1221.

172. *Id.*; *see also* Agnel Philip et al., *63 Million Americans Exposed to Unsafe Drinking Water*, USA TODAY (Aug. 14, 2017), https://www.usatoday.com/story/news/2017/08/14/63-million-americans-exposed-unsafe-drinking-water/564278001 ("Many residents of Tallulah, La., where 77% of the population is black and 40% lives in poverty, have turned to bottled water as their crumbling utility failed to keep water free of toxic disinfectant byproducts.").

173. Negowetti, *supra* note 16, at 467 ("While there are few estimates of the damages caused by nutrients in water sources, the costs incurred by localities to remedy this impact exemplifies the economic impact.").

174. Pollans, *supra* note 73, at 1221–22.

175. *Id.* at 1222.

that it has spent almost $9 million already and would need to spend at least $76 million more to continue meeting federal nitrate standards."[176] According to the EPA, Freemont, a small city in Ohio, will have to spend approximately $15 million to manage nitrate pollution for its 20,000 citizens.[177] Waco, Texas spent more than $70 million from 2002 to 2012 to address problems stemming from algal blooms alone.[178]

Even these few studies and anecdotal evidence make clear that agriculture's water pollution can significantly increase costs for local water utilities to treat and filter water. The rest of the United States is subsidizing conventional agriculture's water pollution bill.[179] That cost is added to the many other costs the rest of the nation pays for conventional agriculture to pollute.

2. Healthcare Costs

As discussed *supra*,[180] water pollution caused by agricultural operations is associated with a bevy of serious health effects and illnesses,[181] thus increasing the health care bills of many Americans affected by water pollution. One study published in 2004 estimated that crop production causes $1 billion in damage to human health per year from pesticides alone.[182] Another study, conducted by the Infectious Diseases Society of America, estimated that the annual cost of treating antibiotic resistance in the United States is $21 to $34 billion.[183] This study is relevant because CAFOs overuse antibiotics to improve growth rates and prevent infections.[184] And, this overuse has "accelerated the development of antibiotic-resistant bacteria, which has taken a toll both in lives and health care dollars."[185]

Health effects related to CAFO manure provide another example. As stated *supra*,[186] consumption of water with elevated levels of arsenic, which is found in

176. *Id.*; *see* Negowetti, *supra* note 16, at 467 n.172 (citing Complaint at 3–4, Bd. of Water Works Trustees v. Sac Cty. Bd. of Supervisors, No. 5:15-cv-04020, 2015 WL 1191173, at *3–4 (N.D. Iowa Mar. 16, 2015)).

177. Pollans, *supra* note 73, at 1222.

178. *Id.*

179. Negowetti, *supra* note 16, at 466–67.

180. *See supra* Part I.C.

181. Negowetti, *supra* note 16, at 455; Steeves, *supra* note 38, at 372; *see generally* Martin et al., *supra* note 136.

182. Negowetti, *supra* note 16, at 469.

183. Martin et al., *supra* note 136, at 2409.

184. *Id.*

185. *The Hidden Costs of Industrial Agriculture*, UNION OF CONCERNED SCIENTISTS (July 11, 2008), https://www.ucsusa.org/resources/hidden-costs-industrial-agriculture; *see also* Nowlin, *supra* note 83, at 1095 ("A vast and growing body of scientific studies provides uncontroverted evidence that the routine use of antibiotics in the production of food animals contributes to the growing public health crisis of human antibiotic resistance and the spread of infectious disease." (internal quotation marks omitted)).

186. *See supra* Part I.C.

CAFO manure, is associated with higher incidences of organ and skin cancer.[187] One study found that skin cancer costs $1,600 per patient to treat in 2011.[188] Another study, published in the Archives of Dermatology, concluded that average treatment costs for melanoma range from "$1[,]732 for stage I disease to $56[,]059 for stage IV disease."[189] For other more serious types of cancer, the average total cost of treatment increases exponentially to approximately $150,000.[190] Although new medications to treat cancer are frequently developed, they are often extremely expensive for the cancer patient.[191] For example, the prescription costs for eleven of the twelve cancer drugs approved by the Food and Drug Administration in 2012 were more than $100,000 annually.[192] Given these incredibly high costs, it is of no surprise that cancer patients are 2.5 times more likely to file bankruptcy than people without cancer.[193]

For those individuals with health insurance, insurance would likely cover some of these medical expenses.[194] The average deductible for an individual is $2,098, and for a family of four, it is $4,037.[195] But the median income in the United States is $35,977 for individuals[196] and $61,937 for households.[197] Thus, even though insurance would likely pay a portion of these bills, the deductibles

187. *See* Steeves, *supra* note 38, at 372; *see also* Agnel Philip et al., *Millions Consumed Potentially Unsafe Water in the Past 10 Years*, TEX. TRIB. (Aug. 16, 2017), https://www.texastribune.org/2017/08/16/millions-consumed-potentially-unsafe-water-past-10-years ("High levels of nitrate from farm runoff and groundwater rock are linked to low oxygen levels in babies and cancer. Those levels have been found in systems serving 317,000 people during the past decade in the valley . . . .").

188. Jenny T. Chen et al., *The Economics of Skin Cancer: An Analysis of Medicare Payment Data*, PRS GLOBAL OPEN, Sept. 2016, at 3, https://journals.lww.com/prsgo/fulltext/2016/09000/the_economics_of_skin_cancer__an_analysis_of.20.aspx.

189. Elena Losina et al., *Visual Screening for Malignant Melanoma: A Cost-Effective Analysis*, 143 ARCH DERMATOL. 21, 23 (2007).

190. Peter Moore, *The High Cost of Cancer Treatment*, AARP MAG. (June 1, 2018), https://www.aarp.org/money/credit-loans-debt/info-2018/the-high-cost-of-cancer-treatment.html.

191. *Id.*

192. *Id.*

193. Diane Mapes, *Hutch Health Economics Releases First Public Report on Cancer Care Quality and Cost*, FRED HUTCH NEWS SERV. (May 1, 2018), https://www.fredhutch.org/en/news/center-news/2018/05/hicor-community-cancer-care-report-released.html.

194. *But see* Donna Rosato, *What to Do When Your Insurer Won't Cover Free Preventative Care*, CONSUMER REPS. (Jan. 17, 2019), https://www.consumerreports.org/health-insurance/what-to-do-when-your-insurer-wont-cover-free-preventive-care ("[A]lmost one-third of Americans with insurance received a surprise medical bill, many for $500 or more. And of those, 12 percent said the bills were for services that should have been free."); Patti Neighmond, *When Insurance Won't Cover Drugs, Americans Make "Tough Choices" About Their Health*, NPR (Jan. 27, 2020), https://www.npr.org/sections/health-shots/2020/01/27/799019013/when-insurance-wont-cover-drugs-americans-make-tough-choices-about-their-health.

195. Chen et al., *supra* note 188, at 2.

196. *See* REAL MEDIAN PERSONAL INCOME IN THE UNITED STATES, FRED ECON. DATA, https://fred.stlouisfed.org/series/MEPAINUSA672N (last updated Sept. 16, 2020) (interactive graph projecting data for real mean personal income 1974–2019 based on information from the U.S. Census Bureau).

197. Gloria Guzman, *New Data Show Income Increased in 14 States and 10 of the Largest Metros*, U.S. CENSUS BUREAU (Sept. 26, 2019), https://www.census.gov/library/stories/2019/09/us-median-household-income-up-in-2018-from-2017.html.

alone still represent a significant portion of both the average individual's and household's income.[198] Moreover, even if an insurance company does pay many of these healthcare bills, the cost to society remains significant, a cost for which conventional agriculture does not pay.

3. Clean Water Benefits Employers and Employees

It is estimated that every year millions of Americans become ill due to polluted water.[199] The number of workdays those people miss because of conventional agriculture's water pollution is unknown. But given that agriculture is a primary and influential source of water pollution throughout the United States,[200] it is likely that a significant percentage of employees miss work because of conventional agriculture's pollution. Absences at work result in pronounced consequences for employers and employees.[201]

Absent employees often do not receive compensation for the time they missed,[202] and such absences could also result in a decrease in earnings by failing to receive raises and bonuses linked to attendance.[203] Such employees also could lose their health insurance and retirement benefits if they are let go for their

198. *See, e.g.*, John Tozzi, *Why Some Americans Are Risking It and Skipping Health Insurance*, BLOOMBERG (Mar. 26, 2018), https://www.bloomberg.com/news/features/2018-03-26/why-some-americans-are-risking-it-and-skipping-health-insurance (describing one family with an annual income of $127,000 per year whose "insurance premium was $1,691 a month last year, triple their mortgage payment–and was going up to $1,813 this year. They also had a $5,000 per-person deductible, meaning that having and using their coverage could cost more than $30,000").

199. *Water Pollution Diseases*, ENV'T POLLUTION CTRS., https://www.environmentalpollutioncenters.org/water/diseases (last visited Jan. 22, 2020) ("According to some estimates, every year a few million Americans are made ill by polluted water."); Charles Duhigg, *Millions in U.S. Drink Dirty Water, Records Show*, N.Y. TIMES (Dec. 7, 2009), https://www.nytimes.com/2009/12/08/business/energy-environment/08water.html ("[A]s many as 19 million Americans may become ill each year due to just the parasites, viruses and bacteria in drinking water. Certain types of cancer . . . have risen over the past 30 years, and research indicates they are likely tied to pollutants like those found in drinking water.").

200. *See* 2017 UN REPORT ON AGRICULTURE, *supra* note 46, at 2.

201. *See, e.g.*, *The Causes and Costs of Absenteeism in the Workplace*, FORBES (July 10, 2013), https://www.forbes.com/sites/investopedia/2013/07/10/the-causes-and-costs-of-absenteeism-in-the-workplace/#3170c9de3eb6; Bill Conerly, *Companies Need to Know the Dollar Cost of Employee Turnover*, FORBES (Aug. 12, 2018), https://www.forbes.com/sites/billconerly/2018/08/12/companies-need-to-know-the-dollar-cost-of-employee-turnover/#5b9a3bdad590; Jack Altman, *How Much Does Employee Turnover Really Cost?*, HUFFPOST (Jan. 19, 2017), https://www.huffpost.com/entry/how-much-does-employee-turnover-really-cost_b_587fbaf9e4b0474ad4874fb7; *see also* Christopher Ingraham, *Employers Who Don't Offer Paid Sick Leave Are Making Flu Season Worse and Hurting Their Own Bottom Line*, WASH. POST (Feb. 13, 2018), https://www.washingtonpost.com/news/wonk/wp/2018/02/13/employers-who-dont-offer-paid-sick-leave-are-making-flu-season-worse-and-hurting-their-own-bottom-line/?utm_term=.8cd8251b537b.

202. *See* Ingraham, *supra* note 201.

203. Rebecca R. Hastings, *Attendance Incentives Are Critical for Some Organizations*, SOC'Y FOR HUM. RES. MGMT. (Sept. 8, 2008), https://www.shrm.org/resourcesandtools/hr-topics/employee-relations/pages/attendanceincentivesare.aspx; Kimberlee Leonard, *Why Is Punctuality Important in the Workplace?*, CHRON (last updated Feb. 4, 2019), https://smallbusiness.chron.com/punctuality-important-workplace-10253.html.

missed time.[204] Even if the employee is not fired, an employer deeming an employee as undependable would likely restrict that employee's chances for promotion and the corresponding earnings that often come with a promotion.[205]

Employers experience a financial drain from an employee's absence. Finding current employees and/or new workers who are available and able to cover for the missing employee's workload increases costs.[206] Employers often have to pay managers for the extra time it takes to find someone to cover the sick employee's shift.[207] This also burdens the employer as those managers could be spending that time on revenue-producing tasks.[208] Additionally, employers often must pay overtime rates to their employees willing to cover the sick employee's shift.[209] If it cannot find current employees to work in place of the sick employee, the employer might have to hire temporary workers, at an inflated hourly rate, to make up for the employee's absence.[210]

4. Many Businesses Are Reliant on Clean Water

Clean water is required for the success of many industries.[211] Significant portions of the tourism industry, as well as many manufacturers, restaurants, and breweries, rely on unpolluted water to function[212] and must use their own

204. Deborah L. Jacobs, *What To Do For Health Insurance When You Lose Your Job*, FORBES (Jan. 21, 2014), https://www.forbes.com/sites/deborahljacobs/2014/01/21/what-to-do-for-health-insurance-when-you-lose-your-job/#2764d50d77b4; *When Fired From a Job Can You Keep Your Pension?*, CHRON (Jan. 20, 2021), https://work.chron.com/fired-job-can-keep-pension-27039.html; *Pension: Retirement and Savings Plans*, WORKPLACE FAIRNESS, https://www.workplacefairness.org/pensions-ERISA#7; *Benefits Employees Are Entitled to After Termination,* HG*,* https://www.hg.org/legal-articles/benefits-employees-are-entitled-to-after-termination-31293 (last visited Sept. 13, 2019).

205. Leonard, *supra* note 203.

206. *The Causes and Costs of Absenteeism in the Workplace*, *supra* note 201.

207. *Id.*

208. *Id.*

209. *Id.*; TOTAL FINANCIAL IMPACT OF EMPLOYEE ABSENCES IN THE U.S., SOC'Y FOR HUM. RES. MGMT. https://www.shrm.org/hr-today/news/hr-magazine/documents/kronos_us_executive_summary_final.pdf.

210. *The Causes and Costs of Absenteeism in the Workplace*, *supra* note 201.

211. *Clean Water is Good for Business Principles*, AM. SUSTAINABLE BUS. COUNCIL, https://www.asbcouncil.org/clean-water-good-business-principles; Zach Bernstein, *Businesses Need Clean Water, Too: Why We Need the EPA's Help***,** GREEN BIZ (Apr. 23, 2014), https://www.greenbiz.com/article/businesses-need-clean-water-too-why-we-need-epas-help; Hannah Greig et al., *Three Reasons Why Businesses Win by Providing Clean Water, Taps and Toilets*, THE GUARDIAN (Sept. 9, 2015), https://www.theguardian.com/sustainable-business/2015/sep/09/business-private-sector-water-sanitation-hygiene-developing-countries-wateraid-unilever-coca-cola.

212. *See* sources cited *supra* note 211; Clarke, *supra* note 158.

resources to filter polluted water.[213] Water filtration is often expensive,[214] and a significant portion of that expense is likely caused by conventional agriculture's water pollution.[215] Therefore, the industry's water pollution financially burdens many businesses.

Many tourism areas are uniquely reliant on clean, unpolluted water to bring tourists to oceans, lakes, rivers, and mountains.[216] For these regions, clean water supports the success of the economy as a whole,[217] while polluted water cripples these local economies and sometimes hurts the entire region or state's economy.[218]

II. AGRICULTURAL EXCEPTIONALISM

Agricultural exceptionalism is the concept that federal and state governments should provide regulatory advantages to conventional agriculture because food production is necessary for human survival.[219] Agricultural exceptionalism started with the Agricultural Adjustment Act of 1933.[220] Since then, "Congress and the courts have built a safety net of statutory exclusions and economic subsidies to support what has become known as 'conventional agriculture': large-scale, highly mechanized, monocultural plant and animal production."[221] This governmental coddling of conventional agriculture has

213. *See* Greig et al., *supra* note 211; *see also* TENN. DEP'T OF ENV'T & CONSERVATION, 2014 305(B) REPORT THE STATUS OF WATER QUALITY IN TENNESSEE 11 (2014), https://www.tn.gov/content/dam/tn/environment/water/documents/wr_wq_report-305b-2014.pdf; INDOOR WATER USE IN THE UNITED STATES, ENV'T PROT. AGENCY (2008), https://www.epa.gov/sites/production/files/2017-03/documents/ws-facthseet-indoor-water-use-in-the-us.pdf.

214. *See, e.g.*, Tim Devaney, *Beer Fight Brewing Over EPA Rule*, THE HILL (Sept. 19, 2014), http://thehill.com/regulation/energy-environment/218249-beer-fight-brewing-over-epa-rule.

215. *See, e.g.*, sources cited *infra* note 218 (exemplifying the loss that can occur when the water in tourist regions reliant on clean water is polluted); *see also* 2017 UN REPORT ON AGRICULTURE, *supra* note 46, at 2.

216. *How Important Is the Ocean to Our Economy?*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., https://oceanservice.noaa.gov/facts/oceaneconomy.html (last visited July 1, 2019); *Travel, Tourism & Hospitality Industry Spotlight*, SELECT USA, https://www.selectusa.gov/travel-tourism-and-hospitality-industry-united-states (last visited Sept. 18, 2019).

217. *Travel, Tourism & Hospitality Industry Spotlight*, *supra* note 216.

218. *See, e.g.*, *Lake Erie Algae Blooms: Polluting Our Drinking Water*, ALL. FOR THE GREAT LAKES, https://greatlakes.org/campaigns/lake-erie-algae-blooms (last visited Jan. 24, 2020); Doug Stanglin, *Red Tide, the Toxic Algae Bloom that Kills Wildlife, Returns to Southwest Florida*, USA TODAY (Nov. 13, 2019), https://www.usatoday.com/story/news/nation/2019/11/13/red-tide-florida-toxic-algae-bloom-returns-southwest-beaches/4177117002 ("Last year, Florida businesses reported nearly $150 million in losses from the killing of fish and other marine creatures that had littered beaches and drove off tourists."); Fears & Rozsa, *supra* note 126; *see also* John Vidal, *How a Picturesque Fishing Town Became Smothered in Trash*, HUFFPOST (May 29, 2019), https://www.huffpost.com/entry/indonesia-plastic-waste-pollution-solutions_n_5cabc096e4b02e7a705c317c; THE ECONOMIC ARGUMENT FOR CLEANING UP THE CHESAPEAKE BAY AND ITS RIVERS 13–14, CHESAPEAKE BAY FOUND., (2012), https://www.cbf.org/document-library/cbf-reports/2012-Economic-Report3788.pdf; Dean, *supra* note 41.

219. Foscolo & Zimmerman, *supra* note 6, at 316 (citing Schneider, *supra* note 10, at 935–36).

220. *Id.*

221. *Id.*

become deep and comprehensive.[222] From environmental regulations to the bankruptcy code and libel laws, conventional agriculture receives significant legal benefits.[223] Conventional agriculture also receives significant direct financial support from taxpayers through federal government subsidies.[224] The combination of these monetary and legal benefits place conventional agriculture in a unique position.[225]

A. Agricultural Exceptionalism Provides Monetary Subsidies

The Federal Government has given farms anywhere from $14 billion to $18 billion in subsidies each year for the last decade.[226] Commodity subsidy payments alone totaled over $5 billion in 2015, half of which went to farmers earning $150,000 or more per year.[227] These subsidies initially began during the Great Depression to keep family farms in operation and ensure a steady food supply for the nation.[228] "Today, these subsidies have grown so lucrative that wealthy investors, large corporations, and farm-estate heirs use taxpayer money to maximize their personal return on investment."[229] Farm subsidies are skewed

222. Chris Edwards, *Reforming Federal Farm Policies*, CATO INST. (Apr. 12, 2018), https://www.cato.org/sites/cato.org/files/pubs/pdf/tbb-82.pdf.

223. Melissa Mortazavi, *Food, Fracking, and Folly*, 50 ARIZ. ST. L.J. 617, 630 (2017) ("Agriculture also receives special treatment under business regulations including bankruptcy, antitrust, and labor laws."); Foscolo & Zimmerman, *supra* note 6, at 317 ("Yet rather than reach a middle ground that balanced agriculture and environmental conservation, policymakers largely yielded to agricultural exceptionalism—nearly every major federal environmental statute passed since the 1970s has included carve-outs for farms."); Sonia Weil, *Big-Ag Exceptionalism: Ending the Special Protection of the Agricultural Industry*, 10 DREXEL L. REV. 183, 222–23 (2017) (discussing laws providing agriculture the ability to halt criticism through the extension of defamation liability).

224. Jennifer Mosquera, Note, *Corn, Cows, and Cash: How Farming Subsidies Work and What They Could Potentially Achieve*, 34 J. LAND USE & ENV'T L. 191, 193–97 (2018) (discussing the long history of agriculture receiving significant monetary subsidies).

225. Mortazavi, *supra* note 223, at 625–26 (discussing the unique regulatory benefits provided to the agriculture industry).

226. *See* EWG FARM SUBSIDY DATABASE, ENV'T WORKING GRP., https://farm.ewg.org/index.php (interactive graphical representation of farm subsidy data by year and state from 2010 to the present) (last updated June 30, 2020); *see also* Emily Moon, *The Trump Administration Will Pay Farmers $16 Billion for Its Trade War*, PAC. STANDARD (July 26, 2019), https://psmag.com/news/the-trump-administration-will-pay-farmers-16-billion-for-its-trade-war ("The U.S. already gives farm operations billions of dollars every year, with most of this going to the biggest producers—and some going to people who are not directly involved with farming, the Government Accountability Office found in 2018.").

227. Tamar Haspel, *Why Do Taxpayers Subsidize Rich Farmers?*, WASH. POST (Mar. 15, 2018), https://www.washingtonpost.com/lifestyle/food/why-do-taxpayers-subsidize-rich-farmers/2018/03/15/50e89906-27b6-11e8-b79d-f3d931db7f68_story.html; *see also* EWG FARM SUBSIDY DATABASE, *supra* note 226 (reporting that these commodity subsidy payments were around $8.95 billion in 2018).

228. Adam Andrzejewski, *Mapping the U.S. Farm Subsidy $1M Club*, FORBES (Aug. 14, 2018), https://www.forbes.com/sites/adamandrzejewski/2018/08/14/mapping-the-u-s-farm-subsidy-1-million-club/#252ebd1f3efc.

229. *See id.*

towards wealthy farms[230] that grow specific types of crops[231] and use conventional agriculture methods.[232]

Agriculture subsidies do not help every farmer, nor do they focus on small, family-owned farms.[233] Instead, over two-thirds of these subsidy payments go to a limited class of farmers, many of which are large businesses.[234] In 2017, 400 entities, including corporations and agri-businesses, received between $1 million and $9.9 million in federal subsidies.[235] This is not a new trend. In 2000, taxpayers gave more than $1 million to fifteen Fortune 500 companies—along with David Rockefeller, Charles Schwab, and Ted Turner.[236] The top recipient alone received more than $500 million in subsidy payments from 1995 to 2005.[237] Yet, "[t]he bottom eighty percent of subsidy recipients saw only $704 [each] on average per year,"[238] and the majority of farmers received no aid at all.[239]

These farm subsidies are generally used by conventional farms to grow specific types of crops.[240] For example, corn, cotton, soybeans, wheat, and rice received 93% of the commodity subsidies from 2002 to 2005, but those crops only comprised 21% of the total farm cash receipts.[241] In contrast, fruit and vegetable producers, as well as most organic farms, have historically not been eligible to receive commodity subsidies.[242] Therefore, these monetary subsidies

230. Daren Bakst, *What You Should Know About Who Receives Farm Subsidies*, HERITAGE FOUND. (Apr. 16, 2018), https://www.heritage.org/agriculture/report/what-you-should-know-about-who-receives-farm-subsidies ("Almost of all [sic] the commodity payments and crop insurance indemnities are going to millionaires and multimillionaires as measured by farm household net worth.").

231. RANDY SCHNEPF, CONG. RSCH. SERV., R44914, FARM SAFETY-NET PAYMENTS UNDER THE 2014 FARM BILL: COMPARISON BY PROGRAM CROP 15 (2017) (detailing that, under the 2014 Farm Bill, 94% of farm-program support goes to corn, cotton, peanuts, rice, soybeans, and wheat).

232. Windham, *supra* note 7, at 14.

233. *Id.* at 29; Bakst, *supra* note 230.

234. Windham, *supra* note 7, at 13; *see also* Bakst, *supra* note 230.

235. *See* Andrzejewski, *supra* note 228.

236. Windham, *supra* note 7, at 14.

237. *Id.* at 13–14.

238. *Id.* at 14.

239. *Id.* ("While the bulk of the money goes to enormous, politically savvy and powerful agricultural operations, sixty percent of all farmers receive no aid at all.").

240. *Id.*

241. *Id.*

242. *Id.* ("Fruit and vegetable producers, as well as most organic farmers, are not eligible for commodity subsidies under the 2002 Farm Bill."); *see* Chad G. Marzen, *The 2018 Farm Bill: Legislative Compromise in the Trump Era*, 30 FORDHAM ENV'T L. REV. 49, 83-86 (2019); *see also* Brian Barth, *Congress Finally Passed a New Farm Bill and It Continues to Pay Homage to the Cult of Corn and Soy*, MOD. FARMER (Jan. 7, 2019), https://modernfarmer.com/2019/01/congress-finally-passed-a-new-farm-bill-and-it-continues-to-pay-homage-to-the-cult-of-corn-and-soy ("Historically, commodity crop growers have had to forfeit their subsidies if they suddenly decide to plant a specialty crop. . . . [T]he 2014 Farm Bill changed the rule to allow up to 15 percent of acreage to be converted to non-commodity crops."). *But see id.* ("To be fair, the USDA already provides a number of incentives for sustainable agriculture. . . . But with such a tiny sliver of American farmland planted with fresh produce—and much less with organic crops—it's clear where political priorities lie.").

largely neglect to assist the most nutritious crops and the most environmentally friendly farms.[243]

B. Agricultural Exceptionalism Provides Regulatory Benefits

Agricultural exceptionalism pervades almost every area of environmental law.[244] Despite the predictability of the pollutants employed by conventional agriculture causing significant environmental damage and creating human health concerns,[245] regulators have done little to curb agricultural pollution.[246] Instead, they have chosen to craft a variety of legal entitlements unique to conventional agriculture.[247] In fact, while other industries must comply with environmental regulation,[248] "nearly every major federal environmental statute passed since the 1970s has included carve-outs for farms."[249] Specifically, conventional agriculture is largely exempt from the CWA, CERCLA, and the CAA.[250]

Although the focus of this Article is on agricultural exceptionalism as it relates to agriculture's water pollution, this Part will also briefly discuss agriculture's exemptions from CERCLA, the CAA, and other regulations to illustrate the pervasiveness of agricultural exceptionalism.

1. The Clean Water Act

The CWA was passed in 1972 and established a program to monitor water quality and limit further water pollution.[251] Since the enactment of the CWA, "most of the nation's surface waters have seen dramatic improvement, but the [CWA's] carve-outs for conventional agriculture have hampered comprehensive progress."[252] These carve-outs include numerous statutory provisions that specifically exempt agriculture from compliance with the CWA.[253] Moreover, in January of 2020, the Trump Administration released its

243. *See* sources cited *supra* note 242.

244. Mortazavi, *supra* note 223, at 628.

245. *See id.*

246. Weil, *supra* note 223, at 199.

247. Foscolo & Zimmerman, *supra* note 6, at 316 ("The intentional result of this safety net has been a bouquet of special entitlements enjoyed by members of almost no other industry."); Weil, *supra* note 223, at 199 ("The agricultural industry has successfully convinced legislatures to enact tailor-made [laws] to protect its unique interests and shield it from public scrutiny of its unsavory practices." (internal quotation omitted)).

248. Foscolo & Zimmerman, *supra* note 6; Weil, *supra* note 223; Negowetti, *supra* note 16, at 458.

249. Foscolo & Zimmerman, *supra* note 6, at 317; *see also* Weil, *supra* note 223.

250. *See supra* text accompanying note 1.

251. *See* 33 U.S.C. §§ 1251–1387 (2012) (originally enacted as Federal Water Pollution Control Act Amendments of 1972, Pub. L. No. 92-500, 86 Stat. 816 (1972)).

252. Foscolo & Zimmerman, *supra* note 6, at 321.

253. *Id.* ("The CWA includes several statutory provisions that benefit farms, which the Environmental Protection Agency (EPA) augmented with additional regulatory exemptions.").

final rule that replaces the Obama Administration's revamp of the CWA.[254] Unsurprisingly, it left agriculture's exemptions intact and even removed previous restrictions that prevented farmers from conducting operations near some waterways.[255] Interestingly, even the CWA revamp under the Obama administration largely left these agricultural exemptions intact, despite its ostensible intent to bolster the CWA's protection of water quality.[256]

Illustrative of its tendency to exempt agriculture, the CWA established the National Pollutant Discharge Elimination System ("NPDES"),[257] but the EPA and Congress have enabled conventional agriculture to evade its strictures.[258] NPDES regulates the allocation of water pollution permits to would-be polluters and imposes monitoring and reporting requirements on permittees.[259] NPDES regulates pollution from "point sources," which discharge pollution from pipes, channels, ditches, or ducts into water sources.[260] Many forms of pollution from conventional agriculture "fit squarely within the CWA's original 1972 definition of point sources, yet the EPA has steadfastly resisted requiring permits—first by administrative fiat; then, after the courts ordered EPA to regulate farms pursuant to the CWA, by a 1977 Act of Congress explicitly excluding agricultural waste as point-source pollution."[261] Importantly, the CWA also does not apply to most CAFOs,[262] which, as discussed *supra*,[263] are one of the biggest water pollution sources in the United States.[264]

The CWA also effectively exempts much of the agriculture industry's nonpoint source pollution by passing the burden of regulating that pollution to states.[265] This exemption is significant because "[a]gricultural nonpoint source

254. The Navigable Waters Protection Rule: Definition of "Waters of the United States," 85 Fed. Reg. 22,250 (Apr. 21, 2020) (to be codified at 33 C.F.R. pt. 328); *see also Final Rule: Navigable Waters Protection Rule*, ENV'T PROT. AGENCY (last updated July 22, 2020), https://www.epa.gov/nwpr/navigable-waters-protection-rule-step-two-revise.

255. *See* sources cited *supra* note 254; Alexandra Kelley, *Trump Administration Rolling Back Protections on Streams and Wetlands*, THE HILL (Jan. 23, 2020), https://thehill.com/changing-america/sustainability/environment/479619-trump-administration-rollbacks-seen-as-crippling; Annie Snider, *Trump Erodes Water Protections: 6 Things to Know*, POLITICO (Jan. 23, 2020), https://www.politico.com/news/2020/01/23/trump-epa-curbs-water-protections-102779.

256. Annie Snider, *Water Policy: Major Obama Proposal Doesn't Change Ag Rules—So Why Are Farm Groups So Worried?*, E&E NEWS (Apr. 17, 2014), https://www.eenews.net/stories/1059998074.

257. Mary Jane Angelo & Jon Morris, *Maintaining a Healthy Water Supply While Growing a Healthy Food Supply: Legal Tools for Cleaning Up Agricultural Water Pollution*, 62 U. KAN. L. REV. 1003, 1004 (2014).

258. *Id.* (stating that a significant shortcoming of the NPDES program is that it does not apply to most agricultural run-off).

259. *See* 33 U.S.C. § 1301(a) (2018) (originally enacted as Federal Water Pollution Control Act Amendments of 1972, Pub. L. No. 92-500, 86 Stat. 816 (1972)); *see also* Jeffrey M. Gaba, *Generally Illegal: NPDES General Permits Under the Clean Water Act*, 31 HARV. ENV'T L. REV. 409, 410 (2007).

260. Gaba, *supra* note 259, at 414–15.

261. Foscolo & Zimmerman, *supra* note 6, at 321–22.

262. Weil, *supra* note 223, at 218.

263. *Supra* Part I.A.

264. *See* 2017 UN REPORT ON AGRICULTURE, *supra* note 46, at 2.

265. Angelo & Morris, *supra* note 257, at 1004 ("[T]he vast majority of state programs have been voluntary or incentive-based programs designed to encourage farmers . . . to reduce run-off of contaminated

pollution contains a variety of additional contaminants that threaten public health and increase the costs of safe water delivery across the country."[266] While the EPA does maintain approval authority over states' compliance plans, states are generally able to choose how to meet the standards.[267] "Rural states that are heavily dependent on agriculture have thus been free to leave farm waste unregulated, even though to regulate it would often represent lower marginal costs of pollution reduction."[268]

2. CERCLA

On its face, CERCLA is an extensive statute that imposes liability on its owners to restore land contaminated by pollution.[269] "Its primary mechanism is rather harsh: it imposes strict, joint, and retroactive (and expensive) liability on all of a site's current and past owners and lessees, including those who may have been otherwise innocent of any contaminating activities."[270] CERCLA identifies an expansive list of substances that may require a cleanup when present.[271] Many of the substances listed are regularly used on farms.[272]

However, alongside exemptions for extreme cases, such as acts of God and war,[273] CERCLA also exempts the application of specific pesticides that are registered under the Federal Insecticide, Fungicide, and Rodenticide Act ("FIFRA").[274] Consequently, farms can use pesticides registered under FIFRA without concern for paying to clean up those pollutants.[275] CERCLA also exempts farms from reporting the use of these hazardous substances.[276]

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water. These programs have had very limited success, and therefore, agricultural pollution continues to be one of the most significant sources of water quality degradation in the U.S.").

266. Pollans, *supra* note 73, at 1205.

267. Foscolo & Zimmerman, *supra* note 6, at 322.

268. *Id.* at 322–23; *see also* Weil, supra note 223, at 219 ("Unfortunately, states have often decided 'not to regulate the environmental hazards of large-scale animal operations' because factory farming generates revenue for the states."); Pollans, *supra* note 73, at 1218 ("The statute allocates regulatory authority over nonpoint sources, including agricultural runoff, to the states, which are free to implement robust controls but typically choose not to.").

269. 42 U.S.C. §§ 9601–9675 (2018); *see also* Foscolo & Zimmerman, *supra* note 6, at 326 ("CERCLA is a robust statute that shifts the costs of remediating contaminated land onto its owners.") (footnote omitted).

270. Foscolo & Zimmerman, *supra* note 6, at 326 (citing 42 U.S.C. § 9607 (2018)).

271. *Id.* (citing 42 U.S.C. §§ 9601–9675 (2018)).

272. *See id.*; *see also* ENV'T PROT. AGENCY, LIST OF LISTS: CONSOLIDATED LIST OF CHEMICALS SUBJECT TO THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT (ECPRA), COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA) AND SECTION 112(R) OF THE CLEAN AIR ACT (2020).

273. *See* Negowetti, *supra* note 16, at 462.

274. *Id.*; Foscolo & Zimmerman, *supra* note 6, at 326–27 (citing to 42 U.S.C. § 9607(i) (2018)); *see also* Mortazavi, *supra* note 223, at 630 ("[T]he structure of the [FIFRA]—the regulatory structure that is most active in the agricultural space—provides an additional shield from . . . CERCLA regulation.").

275. *See* Mortazavi, *supra* note 223, at 630.

276. Foscolo & Zimmerman, *supra* note 6, at 327 (citing 42 U.S.C. § 9601(22) (2012)).

3. The Clean Air Act

The Clean Air Act regulates "major sources" of air pollution that emit more than a threshold quantity of specific pollutants and toxic substances.[277] Conventional farms are significant sources of air pollution because of their release of airborne pesticides and particulate matter into the air.[278] In fact, four of the nation's worst five cities for ambient air quality are in agricultural, not urban, communities.[279] But, Congress conveniently did not provide the CAA a broad enough scope to regulate conventional agriculture's air emissions.[280]

The CAA defines a "major source" of pollution as "any stationary source or group of stationary sources . . . that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants."[281] The CAA then defines a "stationary source" as "any building, structure, facility, or installation which emits or may emit any air pollutant."[282] Because farms are not considered to be facilities, this definition gives farms an exemption to pollute the air.[283] It is also important to note that in *Massachusetts v. EPA*, the Supreme Court held that, under the CAA, greenhouse gases are a "pollutant" and instructed the EPA to regulate them as such.[284] Farms, especially those with livestock operations, generate high concentrations of greenhouse gases.[285] Subsequent to the Supreme Court's ruling, the EPA responded by exempting most agricultural operations from requiring a CAA emissions permit.[286]

4. Regulatory Benefits Beyond Environmental Law

The regulatory benefits provided to conventional agriculture extend beyond environmental law.[287] Agricultural exceptionalism provides conventional agriculture its own specially formulated bankruptcy code,[288]

277. 42 U.S.C. §§ 7401–7671q (2012), *amended by* Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2399; Mortazavi, *supra* note 223, at 629.

278. Foscolo & Zimmerman, *supra* note 6, at 325.

279. *Id.*

280. *Id.*

281. Mortazavi, *supra* note 223, at 629 (internal quotation marks omitted).

282. *Id.*

283. *Id.*

284. Foscolo & Zimmerman, *supra* note 6, at 326 (citing Massachusetts v. EPA, 549 U.S. 497 (2007)).

285. Foscolo & Zimmerman, *supra* note 6, at 326 nn.41–44 (citing studies giving estimates that farms produce between 18% to as much as 51% of all anthropogenic greenhouse gas emissions).

286. *Id.* (citing Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 40 C.F.R. pts. 51, 52, 70, and 71 (2020)).

287. *See* Schneider, *A Reconsideration of Agricultural Law*, *supra* note 10, at 936.

288. Mortazavi, *supra* note 223, at 630.

exemptions from some antitrust laws,[289] exemptions from labor laws,[290] and exemptions from animal cruelty laws.[291] Additionally, several states have passed "Ag-Gag Laws" in response to undercover investigations that exposed animal abuse, dangerous working conditions, food safety issues, and environmental hazards.[292] Ag-Gag Laws vary on a state-by-state basis, but generally, they "limit[] access to agricultural facilities by activists and prohibit[] the distribution of footage and images obtained in such facilities."[293] Additionally, conventional agriculture maintains the unique ability to curtail criticism of the industry through the expansion of defamation liability beyond the limits of traditional defamation law.[294] "This particular kind of defamation, commonly referred to as 'meat libel' or 'veggie libel,' allows the industry to file product disparagement lawsuits against those who criticize its products."[295]

C. Agricultural Exceptionalism Largely Only Benefits Conventional Agriculture

When it comes to agricultural exceptionalism, all foods are not equal. Organic agriculture benefits little from the monetary subsidies and regulatory benefits provided to conventional agriculture,[296] even though it is more environmentally friendly.[297] In fact, organic agriculture receives "only a fraction of the government support that traditional commodities do . . . ."[298] For example, "because organic farmers do not use synthetic production inputs, they

289. *Id.*

290. Weil, *supra* note 223, at 225–26 (citing 29 U.S.C. §§ 152(3), 213(a)(6) (2016)).

291. *See id.* at 212 (citing 7 U.S.C. § 2132(g) (2016)).

292. *See id.* at 199–200.

293. *Id.*

294. *Id.* at 222.

295. *Id.* at 222–23.

296. Foscolo & Zimmerman, *supra* note 6, at 319 ("Alternative agriculture benefits from neither the monetary nor the legal subsidies granted to conventional agriculture . . . ."). The 2018 Farm Bill did include a number of provisions that will help organic agriculture, such as modifying the existing conservation programs to better assist conventional farmers who want to make the switch to organic farming by providing technical and financial assistance, increasing funding for the organic certification program, and providing approximately $400 million in funding for organic farming research. *See* Marzen, *supra* note 242, at 82; *New Farm Bill Signed into Law, Advances Organic*, ORGANIC TRADE ASS'N (Dec. 20, 2018), https://www.ota.com/news/press-releases/20439 [https://perma.cc/S9ZE-AJWA] (also cited in Marzen, *supra* note 242); Colin O'Neil, *The 2018 Farm Bill Is a Big Win for Organic Farming*, EWG: AGMAG (Dec. 14, 2018), https://www.ewg.org/agmag/2018/12/2018-farm-bill-big-win-organic-food.

297. Angelo, *supra* note 17, at 641 ("[Sustainable agriculture] is a powerful approach that can produce high yields and profits for farmers while protecting human health, animal health and the environment." (internal quotation omitted) (discussing a study that evaluated soybean farming in the United States and its conclusion that "the adoption of organic farming practices, which utilize crop rotations and the use of cover crops, can significantly reduce water pollution, air pollution, and water consumption"); Negowetti, *supra* note 16, at 471 (citing FOOD & AGRIC. ORG. OF THE U.N., NATURAL CAPITAL IMPACTS IN AGRICULTURE: SUPPORTING BETTER BUSINESS DECISION-MAKING 6 (June 2015), http://www.fao.org/fileadmin/templates/nr/sustainability_pathways/docs/Natural_Capital_Impacts_in_Agriculture_final.pdf [https://perma.cc/ECS9-3ZNQ]).

298. O'Connor, *supra* note 37, at 442.

do not make use of the federal regulatory 'subsidies' that heavily incentivize the use of chemical fertilizers and pesticides."[299]

Furthermore, the government guarantees income through commodity subsidies,[300] but those subsidies are tied to commodity production not overall farm productivity.[301] This severely limits organic agriculture's ability to receive this type of support because organic farmers must rotate growing commodity crops with nitrogen-fixing legumes or risk ruining the soil's fertility.[302] Agricultural exceptionalism also provides the agriculture industry protection from crop loss through federally underwritten insurance.[303] Until 2013, however, the USDA charged 5% more for organic insurance premiums,[304] yet when organic farmers incur losses of row crops, such as corn and soybeans, they are compensated as though they were growing conventional crops, despite a higher production cost and market price.[305]

Additionally, the legal exemptions that aid conventional agriculture benefit organic agriculture only slightly, if at all.[306] While the value these exemptions offer conventional agriculture is allowing them to pollute water with fertilizers and pesticides,[307] organic agriculture does not use these pollutants in their production process.[308] Therefore, these exemptions largely do not apply to organic agriculture.[309] Similarly, organic agriculture benefits little from cost externalization because it pollutes less.[310] Thus, agricultural exceptionalism generally only benefits conventional agriculture, and even when it does provide some benefit to organic agriculture, it often is not an equivalent one.[311]

299. Foscolo & Zimmerman, *supra* note 6, at 320.

300. *See* Windham, *supra* note 7, at 17; *see also* O'Connor, *supra* note 37, at 442 ("Because of the guaranteed income and continual market for corn from commodity subsidies, farmers are less likely to choose to grow organic.").

301. Windham, *supra* note 7, at 17.

302. *Id.* ("Industrial farmers can continuously produce the same Commodity Crop on the same acre of land year after year with the help of fertilizers and pesticides. Organic farmers, on the other hand, are required biologically to rotate their crops with nitrogen-fixing legumes . . . or they will bankrupt the soil's fertility.").

303. Foscolo & Zimmerman, *supra* note 6, at 316.

304. *Id.* at 319.

305. *Id.* at 319–20.

306. *Id.* at 319.

307. *See id.* at 321–27.

308. *Id.* at 320 ("[B]ecause organic farmers do not use synthetic production inputs, they do not make use of the federal regulatory 'subsidies' that heavily incentivize the use of chemical fertilizers and pesticides."). *See also* O'Connor, *supra* note 37, at 442; Catherine Greene et al., *Growing Organic Demand Provides High-Value Opportunities for Many Types of Producers*, USDA ECON. RSCH. SERV. (Feb. 6, 2017), https://www.ers.usda.gov/amber-waves/2017/januaryfebruary/growing-organic-demand-provides-high-value-opportunities-for-many-types-of-producers.

309. *See* Foscolo & Zimmerman, *supra* note 6, at 319.

310. *See generally* Ruppert, *supra* note 13, at 25–26; Foscolo & Zimmerman, *supra* note 6, at 320 ("Organic agriculture is certainly not an altogether 'green' industry, but along with other forms of alternative agriculture it represents a step in the direction of environmentally-sound food production.").

311. *See* Foscolo & Zimmerman, *supra* note 6, at 319.

III. AGRICULTURAL EXCEPTIONALISM'S IMPACT ON INNOVATION AND COMPETITION

A. Innovation

1. The Porter Hypothesis: Regulation Spurs Innovation

In the 1990s, Michael Porter and Claas van der Linde published what is now known as the Porter Hypothesis.[312] The Porter Hypothesis posits that "properly designed environmental standards can trigger innovation that may partially or more than fully offset the costs of complying with [the standards]."[313] Essentially, the Porter Hypothesis states that regulation can induce technological and/or process innovations when industries have, or are forced to develop, the willingness, capability, and capacity to innovate.[314] That innovation can become a net positive for the company when the added revenue or cost saved is greater than the compliance cost.[315] The Porter Hypothesis argues that "[p]olicy makers, business leaders, and environmentalists have focused on the static cost impacts of environmental regulation and have ignored the more important offsetting productivity benefits from innovation."[316]

The Porter Hypothesis explains that environmental regulation has several important effects on innovation. First, regulation creates "pressure that motivates companies to innovate."[317] Second, regulation acts as a signal to companies that they may be utilizing resources inefficiently and could make technological improvements.[318] Third, regulation alleviates uncertainty regarding the value of an investment directed towards addressing environmental issues.[319] Fourth, regulation "level[s] the playing field during the transition period to innovation-based environmental solutions, ensuring that one company cannot gain position by avoiding environmental investments.

312. *See* John M. Amandolare, Note, *Clean Air the Natural Way: A Case for Harmonizing Global Auto Emissions Standards*, 38 SYRACUSE J. INT'L L. & COM. 201, 222 (2010); *see also* Porter & van der Linde, *A New Conception*, *supra* note 12.

313. Porter & van der Linde, *A New Conception*, *supra* note 12, at 98.

314. *See id.*; *see also* Ashford & Hall, *supra* note 49, at 277.

315. Porter & van der Linde, *A New Conception*, *supra* note 12, at 98.

316. Porter & van der Linde, *Green and Competitive*, *supra* note 52, at 121.

317. *Id.* at 128.

318. *Id.* ("To alert and educate companies about likely resource inefficiencies and potential areas for technological improvement (although government cannot know better than companies how to address them).").

319. Stefan Ambec et al., *The Porter Hypothesis at 20: Can Environmental Regulation Enhance Innovation and Competitiveness?*, RES. FOR THE FUTURE 3, (2011), https://media.rff.org/documents/RFF-DP-11-01.pdf; *see also* Porter & van der Linde, *Green and Competitive*, *supra* note 52, at 128 ("To create demand for environmental improvement until companies and customers are able to perceive and measure the resource inefficiencies of pollution better.").

Regulation provides a buffer for innovative companies until new technologies are proven and the effects of learning can reduce technological costs."[320]

The Porter Hypothesis groups innovation caused by environmental regulation into two categories. The first category involves "new technologies and approaches that minimize the cost of dealing with pollution once it occurs. The key to these approaches often lies in taking the resources embodied in the pollution and converting them into something of value."[321] For example, nylon byproducts, known as diacids, used to be destroyed at a plant in France.[322] But the company operating the plant "installed new equipment to recover and sell these diacids as additives for dyes and tanning and as coagulation agents."[323] The new recovery process provided significant annual revenues.[324]

The second, more important, category "addresses the root causes of pollution by improving resource productivity in the first place."[325] "Resource productivity improves when less costly materials are substituted or when existing ones are better utilized."[326] This category has great potential to produce lasting change by reducing pollution at the source.[327] For example, "[f]orced to comply with new regulations to reduce solvent emissions by 90%, 3M found a way to avoid the use of solvents altogether by coating products with safer, water-based solutions."[328] The change provided 3M with "an early-mover advantage in product development over competitors"[329] and "also shortened its time to market because its water-based product did not have to go through the approval process for solvent-based coatings."[330] The Porter Hypothesis also argues that environmental regulations can spur innovation by companies not currently in the industry.[331] As applied to agriculture, this means regulation could incentivize non-agriculture companies to crossover into the agriculture space and implement new innovations.[332]

As a relatively new theory, the Porter Hypothesis is not without its critics. Some critics have focused their commentary on theoretical disagreements with the Porter Hypothesis.[333] These critics, particularly economists, most

320. Porter & van der Linde, *Green and Competitive*, *supra* note 52, at 128.

321. *Id.* at 125.

322. *Id.*

323. *Id.*

324. *See id.*

325. *Id.*

326. *Id.*

327. *See id.*

328. *Id.* at 126.

329. *Id.*

330. *Id.*

331. Ashford & Hall, *supra* note 49, at 277.

332. *See id.*

333. *See, e.g.*, Michael A. Livermore, *The Meaning of Green Growth*, 3 MICH. J. ENV'T & ADMIN. L. 33, 56 (2013) (citing Karen Palmer et al., *Tightening Environmental Standards: The Benefit-Cost or the No-Cost Paradigm?*, 9 J. ECON. PERSP. 119, 120–21 (1995)).

commonly find fault with the Porter Hypothesis's claim that companies periodically fail to capitalize on advantageous innovations that are technologically available.[334] More specifically, economists criticize the Porter Hypothesis because it is incompatible with the theory that firms are profit maximizing and will always take action that will increase their profits.[335] Therefore, according to the profit-maximization theory, regulation is not necessary to motivate firms to implement innovations that will increase profits.[336] The Porter Hypothesis addresses this critique by arguing that "[t]he possibility that regulation might act as a spur to innovation arises because the world does not fit the Panglossian belief that firms always make optimal choices."[337]

Other critics argue that there is "evidence on beneficial effects of environmental performance on economic performance, but that this Porter Hypothesis only works if very specific conditions are met, related *inter alia*, to the type of policy involved . . . ."[338] For example, some scholars have argued that an industry will not adopt environmentally friendly innovations if the regulatory requirements of the policy are based on the best available technology (BAT).[339] Generally, when implementing regulation based on the BAT, the regulatory body "identifies the [BAT] that is economically achievable for that industry and sets regulatory requirements based on the performance of that technology."[340] Regulations usually do not require polluters to utilize the particular BAT identified,[341] but the policymakers "require facilities to achieve the regulatory standards which were developed based on a particular model technology."[342] This often means that such requirements permit the industry to dispense a specific amount of pollution into the water[343] and that amount is based on the ability of the BAT.[344]

These critics are likely arguing that setting standards based on the BAT does not incentivize innovation because the polluters may comply by merely adopting current technologies;[345] thus, there is less incentive to develop

334. *Id.*

335. *Id.* ("From a theoretical perspective, some economists are uncomfortable with the Porter hypothesis's claim that profit maximizing firms fail to take advantage of productivity increasing innovations, which seems to conflict with economic rationality.").

336. *Id.*; Stefan Ambec et al., *supra* note 319, at 5.

337. Porter & van der Linde, *A New Conception*, *supra* note 12, at 99.

338. Michael Faure, *Effectiveness of Environmental Law: What Does the Evidence Tell Us?*, 36 WM. & MARY ENV'T L. & POL'Y REV. 293, 307 (2012).

339. *Id.*

340. *Learn About Effluent Guidelines*, ENV'T PROT. AGENCY (last visited Mar. 1, 2021), https://www.epa.gov/eg/learn-about-effluent-guidelines.

341. *Id.*

342. *Id.*

343. *Id.*

344. *Id.*

345. *See* Sangeeta Bansal & Shubhashis Gangopadhyay, *Incentives for Technological Development: BAT is Bad*, 30 ENV'T & RES. ECON. 345, 360 (2005).

innovations that limit more pollution than the BAT.[346] In contrast, those same scholars posit that "[i]f, on the other hand, the regulator announces a regulation and sticks to it, irrespective of the technology adopted by the firms, this so-called 'commitment policy not only leads to positive investments in research and development, but is also welfare-improving.'"[347]

Finally, because empirical evidence regarding the Porter Hypothesis is mixed, with studies finding effects that prove and disprove the Porter Hypothesis,[348] "regulatory critics continue to charge that government regulation will cap innovation and squelch industries . . . ."[349] At the same time, supporters "contend that government standards actually incentivize industry to innovate . . . ."[350] The reality is that there is now an abundance of scholarship on this topic, but the conclusions are largely inconsistent.[351] Thus, academic debate over the encouraging or impeding effect of regulation continues.[352]

Addressing and resolving each criticism of the Porter Hypothesis is beyond the scope of this Article, but it is important to note several things when considering this criticism. First, Porter's general thesis—environmental regulations spur innovation—was not a completely new idea.[353] In fact, scholars and experts first posited similar arguments several decades prior to the publishing of the Porter hypothesis.[354]

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346. *See generally* Faure, *supra* note 338, at 307 ("[A]n interesting [article] worth mentioning showed that industry will not adopt cleaner technologies if the regulator announces a policy which is based on best available technologies ("BAT").") (citing Bansal & Gangopadhyay, *supra* note 345, at 360).

347. *Id.* (quoting Bansal & Gangopadhyay, *supra* note 345, at 345–46, 358–59).

348. Livermore, *supra* note 333, at 56 (citing as contrasting viewpoints Eli Berman & Linda T.M. Bui, *Environmental Regulation and Productivity: Evidence from Oil Refineries*, 83 REV. ECON. & STAT. 498, 498–99 (2001); Andrew A. King & Michael J. Lenox, *Does It Really Pay to Be Green? An Empirical Study of Firm Environmental and Financial Performance*, 5 J. INDUS. ECOLOGY 105 (2001); and Stephen M. Meyer, *The Economic Impact of Environmental Regulation*, 3 J. ENV'T L. & PRAC. 4 (1995)).

349. Noah M. Sachs, *Can We Regulate Our Way to Energy Efficiency? Product Standards As Climate Policy*, 65 VAND. L. REV. 1631, 1663–64 (2012) (citing Adam B. Jaffe et al., *The Induced Innovation Hypothesis and Energy-Saving Technological Change,* 113 Q.J. ECON. 941, 941–43 (1999); Porter & van der Linde, *Green and Competitive*, *supra* note 52, at 124; and Vernon W. Ruttan, *Induced Innovation, Evolutionary Theory and Path Dependence: Sources of Technical Change*, 107 ECON. J. 1520, 1520–22 (1997)).

350. Sachs, *supra* note 349, at 1664.

351. *Id.* at 1663 (citing Rene Kemp & Serena Pontoglio, *The Innovation Effects of Environmental Policy Instruments*, 72 ECOLOGICAL ECON. 28 (2011)).

352. *Id.* at 1663–64.

353. *See, e.g.*, Ashford & Hall, *supra* note 49, at 276.

354. *See id.*; *see also* Nicholas A. Ashford et al., *Environmental, Health and Safety Regulations and Technological Innovation*, *in* TECHNOLOGICAL INNOVATION FOR A DYNAMIC ECONOMY 161 (C.T. Hill & J.M. Utterback eds., 1979) (cited and expounded upon in Ashford & Hall, *supra* note 49); Nicholas A. Ashford et al., *Using Regulation to Change the Market for Innovation*, 9 HARV. ENV'T L. REV. 419–66 (1985) (also discussed in Ashford & Hall, *supra* note 49); *accord* Zachary Liscow & Quentin Karpilow, *Innovation Snowballing and Climate Law*, 95 WASH. U. L. REV. 387, 397 (2017) (citing Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention, in* THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS 609 (Nat'l Bureau of Econ. Research ed., 1962)); Roger Cotton & Cara Clairman, *The Effect of Environmental Regulation on Technological Innovation in Canada*, 21 CAN.-U.S. L.J. 239, 248 (1995) ("If regulations impose tough standards, or suggest a trend toward tougher standards, technologies are more likely to be developed to enable industry to comply with those standards.").

Second, and relatedly, since the publication and dissemination of the Porter Hypothesis, other scholars and experts have come to similar conclusions as Porter and van der Linde but have been more specific in their claims.[355] Many have focused on the need for environmental regulations to force polluters to internalize their costs as a way to provide incentives to innovate and reduce their pollution.[356] Others have focused on the impact of regulations on innovation in agriculture specifically.[357] For example, two scholars noted that "[w]hile the conventional agricultural sector has tremendous potential for innovation, it lacks the incentive to innovate in service of environmental or public health."[358]

Third, many of the empirical studies attempting to discredit the Porter Hypothesis have been plagued by the same problem—the difficulty of quantifying change that constitutes innovation.[359] "Those studies that attempt to quantify it (through tracking patent applications in pollution control, for example) often overlook that firms can make environmental improvements in response to regulation through subtle operational changes or through changing inputs, rather than through adding novel, patentable, end-of-pipe technology."[360] Thus, some of the studies used to criticize the Porter Hypothesis are likely flawed in that they define innovation too narrowly.[361]

Finally, although the empirical evidence of regulation's effect on innovation is mixed,[362] many studies concluded that the specific circumstances and design of the regulations heavily influence whether the regulations can induce innovation.[363] Therefore, in applying the Porter Hypothesis to a particular

355. Foscolo & Zimmerman, *supra* note 6, at 318.

356. *Id.* ("When forced to internalize the actual costs of their activities, whether by mandated use of cleaner technologies, permit costs, or penalties for noncompliance, regulated industries are given a tangible incentive to diminish their pollution output."); Schneider, *A Reconsideration of Agricultural Law*, *supra* note 10, at 962; Grossman, *supra* note 25, at 39 (quoting JOINT WORKING PARTY ON AGRIC. AND THE ENV'T, OECD, AGRICULTURE AND THE ENVIRONMENT: LESSONS LEARNED FROM A DECADE OF OECD WORK (2004)).

357. Susan M. Brehm, *From Red Barn to Facility: Changing Environmental Liability to Fit the Changing Structure of Livestock Production*, 93 CALIF. L. REV. 797, 841 (2005) (discussing largescale livestock production and the impact that extending liability to corporate integrators would have on incentivizing the industry to seek out innovation that limits pollution).

358. Foscolo & Zimmerman, *supra* note 6, at 335.

359. Sachs, *supra* note 349, at 1663.

360. *Id.*

361. *See id.*

362. Livermore, *supra* note 333, at 56 ("Empirically, there is a great deal of controversy over whether environmental rules tend to reduce or increase productivity, with studies finding effects in opposite directions."); Sachs, *supra* note 349, at 1663–64.

363. Ashford & Hall, *supra* note 49, at 277 ("The MIT studies revealed that environmental and health and safety regulation—if appropriately designed, implemented, and complemented by economic incentives—can lead to radical technological developments . . . .") (emphasis removed); Sachs, *supra* note 349, at 1663–64; Faure, *supra* note 338, at 306–07 (citing Armin Schmutzler, *Environmental Regulations and Managerial Myopia*, 18 ENV'T & RES. ECON. 87, 87 (2001)); Kjetil Telle, *"It Pays to Be Green"—A Premature Conclusion?*, 35 ENV'T & RES. ECON. 195, 195, 197–98, 215 (2006)) (explaining that "there is indeed evidence on beneficial effects of environmental performance on economic performance, but that this Porter Hypothesis only works if very

industry, it is important to consider the current regulatory environment, the specific circumstances facing the industry, and the proposed regulations.[364]

a. Proof of the Porter Hypothesis: Individual Businesses

Conventional agriculture can develop innovations that reduce the industry's water pollution if properly incentivized. Although conventional agriculture will likely oppose regulations holding it responsible for the costs of its actions, there is a long history of businesses innovating to comply with regulations and incidentally reducing costs while benefitting the environment.[365] Porter and van der Linde provide several examples of environmental regulation stimulating innovation.[366] In 1987, facing regulation that would force it to shut down its wastewater evaporation ponds, Dow Chemical redesigned its production process to eliminate its need for these ponds and reduce its use of a harmful pollutant.[367] This change not only kept Dow in compliance with these regulations but also saved the company $2.4 million per year.[368] Dow's process change cost $250,000 to implement and "reduced caustic waste by 6,000 tons per year and hydrochloric acid waste by 80 tons per year."[369]

In another example, the CAA required Raytheon to eliminate cleaners containing chlorofluorocarbons, a pollutant that hurts the ozone layer, which the company used for cleaning the electronic circuit boards it produced.[370] After initially arguing that elimination of this pollutant was not scientifically possible, Raytheon's scientists were able to introduce a new reusable cleaning agent into the company's cleaning process.[371] This innovation not only complied with the CAA, but it also resulted in an increase in average product quality because the old chlorofluorocarbon-based cleaner would occasionally compromise the circuit boards.[372] Additionally, this change lowered Raytheon's operating costs.[373]

Porter and van der Linde also discuss the example of the Robbins Company, a jewelry producer, which faced the possibility of closing when it was found in violation of its water discharge permits.[374] As a result, the company changed its system for handling the water used in plating jewelry "to a

specific conditions are met, related *inter alia*, to the type of policy involved, the costs of potential innovation projects and their effect on productivity and abatement costs").

364. *See* Porter & van der Linde, *A New Conception*, *supra* note 12.

365. *Id.*

366. *Id.*

367. *Id.*

368. *Id.*

369. *Id.*

370. *Id.* at 101.

371. *Id.*

372. *Id.*

373. *Id.*

374. *Id.* at 102.

closed-loop, zero-discharge system."[375] This new system produced water "40 times cleaner than city water and led to higher-quality plating and fewer rejects. The result was enhanced competitiveness."[376] This change also provided the company with the opportunity to recover valuable precious metals from what used to be the company's waste.[377] Changing to the closed-loop system cost the company $220,000 but resulted in cost savings of "$115,000 per year in water, chemicals, disposal costs, and lab fees and reduced water usage from 500,000 gallons per week to 500 gallons per week."[378]

In a similar example, at a dye plant in New Jersey, new environmental regulations forced the plant to reanalyze its wastewater streams.[379] The plant ultimately altered two of its production processes.[380] These changes resulted in cost savings of $740,000 per year while also increasing product yield by 40%.[381] As part of these changes, the plant also stopped releasing a potentially toxic pollutant into its wastewater.[382]

As stated above, regulation also "can stimulate new entrants to introduce *entirely new products and processes* into the market—products and processes that will displace dominant technologies."[383] For example, Dow Silicone completely displaced Monsanto's use of polychlorinated biphenyls in transformers and capacitators by successfully implementing a different dielectric fluid.[384] Dow Silicone was able to achieve this even though it was a new entrant to the market.[385] This switch provided a boost to the environment because the presence of polychlorinated biphenyls in Monsanto's products had been linked to extensive environmental contamination.[386]

b. Proof of the Porter Hypothesis: New Zealand's Agriculture Industry

New Zealand diminished its agricultural exceptionalism in 1984 by eliminating agriculture subsidies completely.[387] This was a dramatic change because New Zealand's economy is heavily dependent on agriculture, more so

375. *Id.*
376. *Id.*
377. *Id.* at 103.
378. *Id.*
379. *Id.* at 102.
380. *Id.*
381. *Id.*
382. *Id.*
383. Ashford & Hall, *supra* note 49, at 279.
384. *Id.*
385. *See id.*
386. Jonathan Stempel, *Los Angeles County Sues Bayer's Monsanto over PCB Contamination*, REUTERS (May 30, 2019), https://www.reuters.com/article/us-bayer-lawsuit-los-angeles/los-angeles-county-sues-bayers-monsanto-over-pcb-contamination-idUSKCN1T02DJ.
387. Eubanks, *supra* note 11, at 310 n.446.

than the U.S. economy.[388] Now, "New Zealand's farmers are some of the world's most productive and innovative."[389] Since the elimination of the subsidies, New Zealand has experienced "an energizing transformation of the food and farming sectors . . . [and p]rofitability, innovation, and agricultural diversity have returned to farming."[390] Both farm income and farm production have increased.[391] Moreover, as a result of the reforms, New Zealand farmers have "diversified their land use, and developed new products" while also reducing costs.[392]

"Prior to the 1984 reforms, subsidies stifled farm productivity by distorting market signals and blocking innovation."[393] Similar to the United States today, New Zealand maintained nearly 30 subsidies and provided farmers high levels of government aid.[394] All of these subsidies ended with the reforms.[395] That elimination was a "a catalyst for productivity gains" and spurred farmers to "develop[] new products."[396] It also caused farmers to focus on efficient agriculture production, which led to better environmental management.[397] "Cutting farm subsidies, for example, has reduced the previous overuse of fertilizer,"[398] which is a problem plaguing many American farmers.[399] Eliminating subsidies has also caused farms to broaden their revenue-generating operations to encompass activities like rural tourism, which brings environmental management of farms into focus.[400]

2. Innovation Complacency within Agriculture

Innovation in agriculture is imperative for the future physical and financial health of the nation. Currently, conventional agriculture lacks incentive to

388. Mark Ross & Chris Edwards, *In New Zealand, Farmers Don't Want Subsidies*, CATO INST. (July 12, 2017), https://www.cato.org/publications/commentary/new-zealand-farmers-dont-want-subsidies.

389. Josh Siegel, *What Happened When New Zealand Got Rid of Government Subsidies for Farmers*, DAILY SIGNAL (Sept. 22, 2016), https://www.dailysignal.com/2016/09/22/what-happened-when-new-zealand-got-rid-of-government-subsidies-for-farmers.

390. Eubanks, *supra* note 11, at 310 n.446 (quoting DANIEL IMHOFF, FOOD FIGHT: THE CITIZEN'S GUIDE TO A FOOD AND FARM BILL 80–83 (2007)); *see also* Alastair Jardine, *Agricultural Reform in New Zealand*, LIBERALES INST. (2010), https://core.ac.uk/download/pdf/71732533.pdf.

391. Eubanks, *supra* note 11, at 310 n.446.

392. Siegel, *supra* note 389.

393. *See* Ross & Edwards, *supra* note 388.

394. *Id.*

395. *Id.*

396. *Id.*

397. *Id.*

398. *Id.*

399. *This New Approach to Farming Is Transforming Agriculture*, ENV'T DEFENSE FUND, https://www.edf.org/ecosystems/sustainable-agriculture/precision-agriculture (last visited Feb. 14, 2021).

400. Ross & Edwards, *supra* note 388 ("And cutting subsidies has broadened farm operations to encompass activities such as rural tourism that bring management of the rural environment to the fore.").

innovate for three reasons.[401] First, regulations specifically carve out exceptions for the industry that allow it to pollute water.[402] Thus, there is little financial incentive for the industry to invest resources in innovation to comply with regulations from which it is exempt. Second, "[f]armers do not bear the total costs of off-farm pollution and erosion. Most costs are borne by other users of the polluted water. Therefore[,] pollution offers an inexpensive method of waste product disposal for farmers and an opportunity to shift the costs of that waste on to others."[403] Given these financial benefits, conventional agriculture is incentivized to continue to pollute because others must bear the attendant costs.[404] This externalization of costs does not spur conventional agriculture to invest time and money in developing, or acquiring, new technology that reduces water pollution and its costs.[405]

Finally, there is also a general lack of pressure to innovate from consumers, policymakers, and other outside forces because food is ostensibly inexpensive.[406] But food prices at the store do not reflect the true costs of its production.[407] Thus, the consequences of agricultural exceptionalism "are easily ignored by consumers and policymakers who support the production and availability of 'cheap' food."[408] At the same time, policymakers likely ignore negative consequences of agricultural exceptionalism due to the industry's substantial lobbying efforts.[409] In 2018, agriculture spent $134.8 million to lobby U.S. policymakers.[410] This put agriculture among the top ten spenders in the United States.[411]

An analysis of conventional agriculture's recent history of developing and implementing new innovations plainly reveals that the industry is suffering from innovation complacency.[412] For example, recent studies have shown that the utilization of prairie plants could reduce pollution runoff from crop fields and

401. Foscolo & Zimmerman, *supra* note 6, at 335; Waliser, *supra* note 132, at 76.

402. Foscolo & Zimmerman, *supra* note 6, at 317, 321.

403. David Zaring, *Agriculture, Nonpoint Source Pollution, and Regulatory Control: The Clean Water Act's Bleak Present and Future*, 20 HARV. ENV'T L. REV. 515, 528 (1996).

404. *Id.*

405. *But see* Foscolo & Zimmerman, *supra* note 6, at 334 ("This is not to imply that conventional agriculture has been stagnant with respect to innovation. . . . But these innovations continue to be geared toward production of tonnage at the exclusion of other objectives."); *The Hidden Costs of Industrial Agriculture*, UNION OF CONCERNED SCIENTISTS (July 11, 2008), https://www.ucsusa.org/resources/hidden-costs-industrial-agriculture (discussing cost-reducing innovations that are available to the agriculture industry but are not prioritized by current agricultural policy).

406. Negowetti, *supra* note 16, at 464–65.

407. *Id.*; Waliser, *supra* note 132, at 75.

408. Negowetti, *supra* note 16, at 464–65.

409. *Ranked Sectors for Lobbyist Total Spending*, OPENSECRETS.ORG (last updated Jan. 23, 2021), https://www.opensecrets.org/federal-lobbying/ranked-sectors?cycle=2018 (providing interactive compilation of ranked spending calculations based on data from the Senate Office of Public Records).

410. *Id.*

411. *Id.*

412. Foscolo & Zimmerman, *supra* note 6, at 334.

ultimately reduce water pollution from conventional agriculture.[413] By strategically planting this mix of plants on sloping areas of the field, "water flowing by will be slowed and will prevent soil and nutrients from washing away."[414]

This innovation is not technologically advanced, so conventional agriculture did not need to wait for the technological capability to implement this change. Yet, it took a study funded largely by state government agencies—Iowa State University, Iowa Department of Agriculture and Land Stewardship, and Iowa Flood Center—to make it known that such a change could drastically reduce pollution.[415]

There are other innovations currently in use that help reduce some of the harmful effects of conventional agriculture's water pollution. For example, conventional agriculture utilizes phosphorus to increase plant and animal growth, but phosphorous also has harmful effects on water quality.[416] Because of technological innovation, phosphorus now can be recovered from water and converted into a more environmentally friendly fertilizer.[417] Although this helps to reduce the harmful effects of conventional agriculture's pollution, the Madison Metropolitan Sewage District implemented this technology, not conventional agriculture.[418] Rather than conventional agriculture developing and paying for a solution, a city water utility sought out and implemented a solution,[419] and the citizens of Madison, Wisconsin, are paying for it through taxes and increased water bills.[420] Similarly, the city of Boise, Idaho,

413. *See* Amy Mayer, *Strips of Native Prairie Plants Could Reduce Pollution Runoff from Farm Fields*, HARVEST PUB. MEDIA (Oct. 2, 2017), https://www.harvestpublicmedia.org/post/strips-native-prairie-plants-could-reduce-pollution-runoff-farm-fields; Donnelle Eller, *Prairie Strips can Reduce Nutrient Loss*, DES MOINES REG. (Dec. 3, 2014), https://www.desmoinesregister.com/story/money/agriculture/2014/12/03/researchers-prairie-strips-reduce-nutrient-loss/19801989; *see generally* Lisa A. Schulte et al., *Prairie Strips Improve Biodiversity and the Delivery of Multiple Ecosystem Services from Corn-Soybean Croplands*, 114 PROCS. NAT'L ACAD. SCIS. U.S.A. 11247 (2017), https://www.pnas.org/content/114/42/11247.full.

414. Mayer, *supra* note 413 (citing Schulte et al., *supra* note 413).

415. *See* Schulte et al., *supra* note 413; *see also* EARL BLUMENAUER, GROWING OPPORTUNITIES: REFORMING THE FARM BILL FOR EVERY AMERICAN 10 (2017), https://blumenauer.house.gov/sites/blumenauer.house.gov/files/documents/GrowingOpportunities.pdf (discussing agricultural innovations and technological breakthroughs and that "[p]ublicly financed research is the key to many of these important breakthroughs.").

416. ANDREW SHARPLEY & DOUGLAS BEEGLE, MANAGING PHOSPHORUS FOR AGRICULTURE AND THE ENVIRONMENT 2 (2001), https://extension.psu.edu/programs/nutrient-management/educational/soil-fertility/managing-phosphorus-for-agriculture-and-the-environment/extension_publication_file.

417. *See Examples of Innovation in the Water Sector*, ENV'T PROT. AGENCY, https://www.epa.gov/water-innovation-tech/examples-innovation-water-sector#market2 (Sept. 15, 2020).

418. *Madison Metropolitan Sewerage District and Ostara Help Dane County Lead the Way in Reducing Nutrient Pollution*, OSTARA (June 4, 2014), https://ostara.com/project/madison-metropolitan-sewerage-district-and-ostara-help-dane-county-lead-the-way-in-reducing-nutrient-pollution; *What We Do: Environmental Initiatives*, MADISON METRO. SEWERAGE DIST., https://www.madsewer.org/About-Us/What-We-Do (last visited Mar. 15, 2021); ENV'T PROT. AGENCY, *supra* note 417.

419. *See* sources cited *infra* note 432.

420. *See* sources cited *infra* note 436.

implemented a new system at its water renewal facility to "manage nuisance struvite deposits and recover phosphorous."[421]

Conventional agriculture often allows others to pay for new technologies that reduce the harms the industry creates, but conventional agriculture has shown the ability to innovate when it makes financial sense for the industry.[422] For example, many farmers have implemented the use of "data gathered from sensors, tractors and satellites . . . to track crop health, make planting decisions and guide fertilizer use to improve the efficiency of their businesses like never before."[423] Farmers have utilized this style of farming, known as precision agriculture, because it is particularly helpful in reducing fertilizer loss.[424] Crops only absorb 40% of the total nitrogen fertilizer applied,[425] and nitrogen fertilizer loss is a substantial expense for many farmers.[426] Thus, reducing that loss could significantly improve their bottom line.[427] While nitrogen fertilizer is also a significant component of conventional agriculture's total water pollution,[428] it is unlikely that reducing such pollution is more than a coincidental side effect of farmers' desire to reduce costs and improve the bottom line.[429]

If the regulatory structure changed to more accurately reflect the costs of conventional agriculture's water pollution, conventional agriculture's incentive to increase profit would then align with reducing environmental degradation and the harmful financial effects of water pollution. As the above example illustrates,[430] conventional agriculture can develop and implement technological innovations so long as those innovations improve profit.[431]

3. The Impact of Agriculture's Lack of Innovation

As discussed in more depth in Part I, the effects of agriculture's lack of innovation—and lack of incentive to change their behavior—are felt throughout the United States. First, a lack of innovation results in a higher amount of water pollution.[432] This reflects the lack of incentive to develop pollution-reducing innovations under the current regulatory framework.[433] It is

421. ENV'T PROT. AGENCY, *supra* note 417.

422. *See, e.g.*, *This New Approach to Farming Is Transforming Agriculture*, ENV'T DEF. FUND, https://www.edf.org/ecosystems/sustainable-agriculture/precision-agriculture (last visited Mar. 15, 2021).

423. *Id.*

424. *Id.*

425. *Id.*

426. *Id.*

427. *Id.*

428. *Id.*

429. *See id.*

430. *Id.*

431. *See id.*

432. Negowetti, *supra* note 16, at 453–54; *see also* Porter & van der Linde, *Green and Competitive*, *supra* note 52, at 125.

433. Foscolo & Zimmerman, *supra* note 6, at 335; Ashford & Hall, *supra* note 49.

not a surprise then that little innovation has occurred,[434] which likely helps explain some of the environmental degradation experienced throughout the United States.[435]

Second, a higher amount of water pollution increases expenses for the rest of the United States. Businesses and individuals are responsible for expenses that are caused by conventional agriculture's water pollution, such as healthcare costs, filtration costs, and many others.[436] Third, businesses and individuals also experience a decrease in the financial benefits of having clean water, such as drops in tourism and fishing revenue.[437]

B. Competition

1. The Porter Hypothesis: Regulation Encourages Competition

The Porter Hypothesis does not just argue that regulation can cause innovation. It also argues that regulation improves the competitiveness of the regulated industry in several ways. Environmental regulation can spur firms to "increas[e] the 'resource efficiency' of production,"[438] as well as to "increase[e] the quality of the products."[439] "Furthermore, Porter argues that early regulation that spurs compliance innovation can provide the regulated industry with a first-mover advantage, thereby capturing market share from competitors . . . ."[440]

Increasing the resource efficiency of production involves decreasing the utilization of harmful resources.[441] This is beneficial because under the new regulation, decreasing the use of such resources also decreases costs[442] and makes the company more competitive.[443] This spurs competition as firms

434. Foscolo & Zimmerman, *supra* note 6, at 334.

435. *Id.* at 334–35.

436. *See* Schneider, *Reconsidering the Industrialization of Agriculture*, *supra* note 17 (describing the cost externalization of harmful agricultural practices); Negowetti, *supra* note 16, at 469–74; *Great Lakes Restoration Initiative*, BUS. DEV. CORP. (April 25, 2017), https://monroecountybdc.org/great-lakes-restoration-initiative/ (explaining that restoring the damage done to the water quality in the Great Lakes by water pollution "would generate $80 billion to $100 billion in benefits").

437. Andrew Clarke, *Businesses Depend on Strong Clean-Water Rules*, CHI. TRIB. (Oct. 1, 2015), http://www.chicagotribune.com/suburbs/daily-southtown/opinion/ct-sta-clean-water-commentary-st-0925-20151001-story.html; *The Effects: Economy*, ENV'T PROT. AGENCY, https://www.epa.gov/nutrient pollution/effects-economy (last visited Mar. 15, 2021) (explaining that the national tourism industry loses nearly $1 billion every year to pollution largely due to decreases in recreational business revenue).

438. LUKE A. STEWART, INFO. TECH. & INNOVATION FOUND., THE IMPACT OF REGULATION ON INNOVATION IN THE UNITED STATES: A CROSS-INDUSTRY LITERATURE REVIEW 8 (2010) (citing Michael E. Porter, *America's Green Strategy*, *in* 264 SCI. AM. 168, 168 (1992); Porter & van der Linde, *A New Conception*, *supra* note 12; Ashford & Hall, *supra* note 49).

439. *See* Stewart, *supra* note 438.

440. *See id.*

441. Porter & van der Linde, *Green and Competitive*, *supra* note 52, at 120–22, 125–26.

442. *Id.* at 120.

443. *Id.*

compete to minimize their use of such harmful resources.[444] Similarly, increasing the quality of products can occur through reducing the negative environmental impact of those products.[445] This enhances the desirability of such a product as consumer demand has shifted towards more environmentally friendly products.[446] This increases competition concerning which firms can produce the most desirable products with the least impact on the environment.[447] For example, Method developed a line of green household cleaning products before larger firms, like Proctor and Gamble, recognized that consumers would be willing to pay more for a more environmentally friendly product.[448] This gave Method a first-mover advantage in what has since become a competitive market for organic household cleaning products.[449]

Some critics may argue that increasing regulation of conventional agriculture will decrease the competitiveness of U.S. agriculture globally. The Porter Hypothesis argues the opposite— "countries adopting a stringent environmental regime should not be afraid that this endangers their competitive position, since the evidence shows that this may speed up economic growth rather than retard it."[450] Porter and van der Linde reinforce this claim through their studies of several countries' implementation of environmental regulations and the resulting impact on their economies.[451]

"For example, Germany enacted recycling standards earlier than in most other countries, which gave German firms an early-mover advantage in developing less packaging-intensive products, which have been warmly received in the marketplace."[452] Similarly, "Scandinavian pulp and paper producers have been leaders in introducing new environmentally friendly production processes, and thus Scandinavian pulp and paper equipment suppliers such as Kamyr and Sunds have made major gains internationally in selling innovative bleaching equipment."[453] Porter and van der Linde also provide a parallel example in the United States. Cummins Engine developed low-emissions diesel engines in response to U.S. environmental regulations.[454] The company's new ability to

444. *Id.* at 120, 125–26, 128–31.

445. *Id.* at 132–33.

446. *Id.* at 120; Porter & van der Linde, *A New Conception*, *supra* note 12, at 104.

447. *See* sources cited *infra* note 460.

448. *See Our Story: Method Firsts*, METHOD, https://methodhome.com/about-us/our-story (last visited Mar. 15, 2021); *see also* Rod Kurtz, *A Soap Maker Sought Compatibility in a Merger Partner,* N.Y. TIMES (Jan. 16, 2013), https://www.nytimes.com/2013/01/17/business/smallbusiness/a-founder-of-the-soap-maker-method-discusses-its-sale.html; How I Built This with Guy Raz, *Method: Adam Lowry & Eric Ryan*, NAT'L PUB. RADIO (Oct. 8, 2018) (downloaded using Apple Podcasts).

449. *See* Greene et al., *supra* note 308.

450. Faure, *supra* note 338, at 299; *see also* David M. Driesen, *The Societal Cost of Environmental Regulation: Beyond Administrative Cost-Benefit Analysis*, 24 ECOLOGY L.Q. 545, 576 (1997).

451. *See* Porter & van der Linde, *Green and Competitive*, *supra* note 52.

452. Porter & van der Linde, *A New Conception*, *supra* note 12, at 104–05

453. *Id.* at 105.

454. *Id.*; *see also* Porter & van der Linde, *Green and Competitive*, *supra* note 52, at 127.

create such engines increased demand in markets outside the United States and improved Cummins's international market share.[455] As international markets continue to value and demand environmentally friendly products,[456] strengthening domestic environmental regulations would likely encourage economic growth in the agriculture industry.[457]

2. Decreasing the Price Disparity Would Increase Competition

Agricultural exceptionalism hinders organic agriculture from competing against conventional agriculture.[458] In fact, "[c]urrent agricultural policy in the United States . . . largely allows agriculture to externalize its pollution costs to the detriment of the competitiveness of conservation-based agriculture."[459] Organic agriculture causes comparatively low societal costs.[460] Organic agriculture achieves this by implementing sustainable practices like rotating crops to improve soil fertility and using environmentally friendly fertilizers.[461] Although these methods ultimately result in less pollution and lower societal costs, they are more expensive to implement.[462] But because organic farmers do not benefit to the same extent from cost externalization, pricing of organic products more accurately reflects their true costs.[463]

Conventional agriculture typically does not have to compete with organic agriculture on price.[464] With lower up-front costs and the benefit of externalizing the costs of their pollution, conventional agriculture can price its products more cheaply than organic agriculture.[465] By rolling back agricultural exceptionalism, regulators would force conventional agriculture to incorporate its true costs into its pricing.[466] This would decrease the price disparity between

455. Porter & van der Linde, *A New Conception*, *supra* note 12, at 105; *see also* Porter & van der Linde, *Green and Competitive*, *supra* note 52, at 127.

456. Porter & van der Linde, *A New Conception*, *supra* note 12, at 104.

457. Faure, *supra* note 338, at 299.

458. Ruppert, *supra* note 13, at 26 ("Accounting for externalized costs and inputting them into the analysis allows conservation-type farming methods to compete economically.").

459. *Id.*

460. Foscolo & Zimmerman, *supra* note 6, at 320; Angelo, *supra* note 17, at 641; Negowetti, *supra* note 16, at 471; Greene et al., *supra* note 308.

461. Angelo, *supra* note 17, at 641–42; Foscolo & Zimmerman, *supra* note 6, at 320; Negowetti, *supra* note 16, at 471 (citing FOOD & AGRIC. ORG. OF THE U.N., NATURAL CAPITAL IMPACTS IN AGRICULTURE: SUPPORTING BETTER BUSINESS DECISION-MAKING 6 (2015)); Greene et al., *supra* note 308.

462. Greene et al., *supra* note 308.

463. Foscolo & Zimmerman, *supra* note 6, at 320; Angelo, *supra* note 17, at 641–42; Negowetti, *supra* note 16, at 471–74; Greene et al., *supra* note 308.

464. O'Connor, *supra* note 37, at 442.

465. Ruppert, *supra* note 13; Greene et al., *supra* note 308.

466. Foscolo & Zimmerman, *supra* note 6, at 337 ("At least in the short term, any tightening of environmental regulations on conventional farms will almost certainly raise food prices, which have already been on the rise in recent years.").

conventional and organic agriculture and would likely increase price competition as a result.

Basic economics demonstrates that regulating the agriculture industry would increase competitiveness among conventional and organic farming. First, curtailing agricultural exceptionalism would increase the price of conventional agriculture's crops due to its significant pollution costs.[467] But limiting agricultural exceptionalism would likely not increase the price of organic agricultural products because organic agriculture pollutes far less.[468] Thus, an increase in the price of conventional agriculture food products would close the price disparity between conventional and organic agriculture.[469]

Due to the increase in conventional agriculture's price, consumers would purchase more organic crops.[470] Consumers would switch to organic because when the price of a good increases, demand for a substitute good increases.[471] "For example, if the price of coffee increases, the quantity demanded for tea (a substitute beverage) increases . . . ."[472] Additionally, price changes are an influential determinant of consumers' food demand.[473] When the price of a good increases, the amount demanded decreases.[474]

3. Incentivizing Pollution-Reducing Competition

Currently, firms within agriculture are not competing over decreasing water pollution costs because agricultural exceptionalism protects conventional agriculture from responsibility for these costs.[475] Conversely, if agricultural exceptionalism were curtailed, conventional agriculture would then aim to limit any increased expenses from complying with regulations and the internalization of pollution costs.[476] This would incentivize competition concerning price and

467. *Id.*

468. *Id.* at 320.

469. *Id.* at 335.

470. *See* Adam Hayes, *Cross Elasticity of Demand*, INVESTOPEDIA (last updated Mar. 14, 2020), https://www.investopedia.com/terms/c/cross-elasticity-demand.asp.

471. *Id.* ("The cross elasticity of demand for substitute goods is always positive because the demand for one good increases when the price for the substitute good increases.").

472. *Id.*

473. *Food Demand Analysis*, USDA ECON. RSCH. SERV. (last updated Feb. 24, 2021), https://www.ers.usda.gov/topics/food-choices-health/food-consumption-demand/food-demand-analysis.

474. David R. Henderson, *The Concise Encyclopedia of Economics: Demand*, LIBR. OF ECON. & LIBERTY, http://www.econlib.org/library/Enc/Demand.html (last visited Mar. 1, 2021) ("The most famous law in economics, and the one economists are most sure of, is the law of demand. . . . The law of demand states that when the price of a good rises, the amount demanded falls, and when the price falls, the amount demanded rises."); *see also* Irena Asmundson, *Supply and Demand: Why Markets Tick*, INT'L MONETARY FUND, https://www.imf.org/external/pubs/ft/fandd/basics/suppdem.htm (Feb. 24, 2020).

475. *See* Foscolo & Zimmerman, *supra* note 6, at 318, 335; Grossman, *supra* note 25; Schneider, *A Reconsideration of Agricultural Law*, *supra* note 10, at 962; Porter & van der Linde, *A New Conception*, *supra* note 12, at 98; Ashford & Hall, *supra* note 49.

476. *See* Foscolo & Zimmerman, *supra* note 6, at 335.

innovation throughout the industry.[477] Similarly, there would likely be an increase in technological competition involving innovations that reduce water pollution.[478] Firms within the entire industry would compete over having the best technology that most limits water pollution and decreases costs.[479] The underlying focus of all of this new competition would be reducing pollution to reduce the parallel costs and, ultimately, increase profits.[480] If a firm chose not to compete in this manner, it would likely be uncompetitive in the marketplace and would be replaced by one that would.[481]

The increased competitiveness would decrease water pollution and benefit society by reducing the amount of water-pollution-related costs, increasing the financial benefits of clean water, and improving overall health.[482] The agriculture industry would also benefit by leveling the competitive playing field for the entire industry.[483] Success would no longer be predicated on which farms took the most advantage of financial and legal support provided by the Government.[484] The firms best acquiescing to consumer demand, complying with regulations, limiting costs, and producing the best product could then succeed.[485]

IV. SOLUTIONS

It is no secret that agriculture's water pollution presents serious and significant problems for society.[486] The regulatory allowance of such pollution, although intended to help the agriculture industry, has ultimately stunted the industry's growth and evolution by limiting its incentive to innovate and created an uncompetitive market.[487] There are actions policymakers could take to curtail agricultural exceptionalism and, ultimately, reinvigorate competition and innovation in this stagnant market.[488] Scholars and experts have discussed a variety of solutions to this problem. This Part will focus on several potential solutions that are the most relevant and likely to succeed. An analysis of every

477. *See id.* at 335–36.

478. Porter & van der Linde, *Green and Competitive*, *supra* note 52, at 120; Porter & van der Linde, *A New Conception*, *supra* note 12, at 104.

479. *See* Porter & van der Linde, *A New Conception*, *supra* note 12, at 98.

480. *See id.*

481. *See id.*

482. *See generally* Foscolo & Zimmerman, *supra* note 6, at 318, 335; Grossman, *supra* note 25; Schneider, *A Reconsideration of Agricultural Law*, *supra* note 10, at 962; Porter & van der Linde, *A New Conception*, *supra* note 12, at 98; Ashford & Hall, *supra* note 49; Porter & van der Linde, *Green and Competitive*, *supra* note 52, at 120.

483. Foscolo & Zimmerman, *supra* note 6, at 318, 335.

484. *See* Waliser, *supra* note 132, at 55.

485. *See* Eubanks, *supra* note 11; Petit, *supra* note 23.

486. *See* Angelo, *supra* note 17, at 603–07.

487. Foscolo & Zimmerman, *supra* note 6, at 318, 335; Grossman, *supra* note 25.

488. *See* Angelo & Morris, *supra* note 257, at 1038–39; Driesen, *supra* note 450, at 553; Ruhl, *supra* note 68, at 337–38; Ristino & Steier, *supra* note 14, at 104.

possible solution, however, is beyond the scope of this Article, as is a declaration of which solution is best. Moreover, it is likely combining several policy changes would produce the most effective solution.

A. Banning Fertilizer

As mentioned several times in this Article, any regulatory reform of agricultural exceptionalism needs to focus on limiting the industry's ability to externalize costs. With that in mind, some scholars have suggested implementing a ban at either the state or federal level on hazardous fertilizer.[489] Banning such fertilizer appears to be an extreme measure, but given the extent of the harm caused by fertilizer, this solution would likely help solve some of the most serious consequences of fertilizer pollution. Some scholars posit that such a ban should allow the use of fertilizers only if the producer or would-be user can prove that a particular fertilizer is safe.[490] This shifts the burden to the producer or potential user to prove that a particular fertilizer does not negatively impact human health and the environment.[491] This represents a substantial shift. Currently, "the burden is on the challenger to prove that the harms from a substance outweigh the benefits, and such proof often requires a level of certainty that may be impossible to attain."[492] Shifting the burden of proof would also force agriculture to internalize more of its costs[493] because the agriculture industry or fertilizer producers would have to find "better, cleaner, and safer inputs and production methods" [494] for their fertilizer in order to prove that it is safe.[495]

Thus, a farmer who wished to use a particular fertilizer would have to treat it, reduce its use, reduce runoff, plant runoff-preventing crops (like prairie strips), and take other active measures to prove the fertilizer posed no risk to be allowed to use it.[496] Although these actions would increase industry costs,[497] it would decrease water pollution and the attendant societal costs.[498] A fertilizer ban would thus force the industry to at least partially bear the costs of fertilizer pollution.[499]

489. Waliser, *supra* note 132, at 51.

490. *Id.* at 55.

491. *Id.* at 93.

492. *Id.* at 80.

493. *Id.* at 115–16.

494. *Id.* at 93.

495. *Id.* at 94 (discussing a California law passed to protect water from pollution and how this incentivizes the business responsible for the pollution to avoid using banned chemicals or to limit pollution below levels that pose any significant health risks).

496. *Id.*

497. Coppess, *supra* note 4, at 384–86.

498. *See* Waliser, *supra* note 132, at 54–55, 76–78, 118.

499. *Id.* at 118.

Banning fertilizer would produce several other significant benefits. A ban would improve health, water quality, and the environment[500] because fertilizer is a primary source of environmental degradation and related health issues.[501] It would also "promote the regulatory values of efficiency, equity, and sustainability."[502] This is because by shifting the burden of product safety, a ban "forces hazardous substance generators and the fertilizer industry to internalize costs that are currently externalized to the general public."[503] Thus, society's financial burden for agriculture's pollution would decrease.[504] This is fair and equitable.[505] The internalization of such costs would not only decrease the financial burden to society and improve health, but as already discussed, it would also strengthen the agriculture industry by incentivizing innovation and competition.[506]

B. Taxing Conventional Agriculture's Water Pollution

The problems associated with agriculture's water pollution have resulted in a call for a tax to disincentivize polluting behavior.[507] Such a tax would also create a revenue stream that policymakers could then direct toward relieving the resulting harm.[508] Such a tax could take many forms—for example, a tax on nitrogen levied on fertilizer used in agriculture.[509] Another potential tax solution would be to tax agricultural byproducts, such as manure and other farm

500. *Id.*

501. *See, e.g.*, *This New Approach to Farming Is Transforming Agriculture*, ENV'T DEF. FUND, https://www.edf.org/ecosystems/sustainable-agriculture/precision-agriculture (last visited Mar. 15, 2021).

502. Waliser, *supra* note 132, at 118.

503. *Id.*

504. *See id.*

505. *See id.*

506. *See supra* Parts III.A, III.B (discussing applications of the Porter Hypothesis to the agricultural industry).

507. William J. Even, *Green Payments: The Next Generation of U.S. Farm Programs?*, 10 DRAKE J. AGRIC. L. 173, 181 (2005).

508. *See* Angelo & Morris, *supra* note 257, at 1038–39.

509. Even, *supra* note 507, at 181 n.59 (citing SOIL AND WATER CONSERVATION SOC'Y, SHARING THE COST: CREATING A WORKING LAND CONSERVATION TRUST FUND THROUGH A TAX ON AGRICULTURAL INPUTS? 15 (2003)) (recounting the details of "an Iowa program that combines an excise tax on nitrogen fertilizer with pesticide registration fees to create a fund used to support conservation activities in the state."); *see also* Douglas R. Williams, *When Voluntary, Incentive-Based Controls Fail: Structuring a Regulatory Response to Agricultural Nonpoint Source Water Pollution*, 9 WASH. U. J.L. & POL'Y 21, 121 (2002) ("For example, a reasonable tax on fertilizers, pesticides, and high-nutrient feed for confined animal operations would both help to defray the costs of implementing pollution control measures and provide incentives for wiser use of these inputs."); Nathalie J. Chalifour & Heather McLeod-Kilmurray, *The Carrots and Sticks of Sustainable Farming in Canada*, 17 VT. J. ENV'T. L. 303, 340 (2016) ("Adding or increasing taxes on fertilizers or pesticides is one way to discourage their use because the taxes add costs to those inputs. Such taxes have been used, to date, primarily in Europe.").

residues, which contribute to water pollution.[510] Or the government could implement a nutrient-loss tax that taxes agriculture based on the amount of pollution runoff on a specific farm.[511] It could also implement an "agricultural privilege tax" that taxes agriculture operations based on the amount of acres used.[512]

Many economists are in agreement that government should place a tax on producers to force them to internalize their costs of production.[513] When polluters pay for clean-up costs, polluters will likely pass that cost to consumers through the purchase price of the product.[514] "Thus, producers who figure out how to clean-up more cheaply will have an advantage over polluters who do not."[515] Therefore, such a tax would likely incentivize the agriculture industry to innovate and would create competition in an otherwise stagnant market.[516] Moreover, a tax would incentivize farmers to decrease their use of harmful pollutants to save money.[517] All of these results would benefit society and the industry.[518]

C. Increasing Transparency and the Availability of Information

Regardless of the type of action taken to regulate agriculture's water pollution, increased transparency and information regarding agriculture's water pollution is necessary.[519] Currently, this is not feasible.[520] "The lack of transparency surrounding the food system is pervasive."[521] In fact, several regulations severely limit information, such as which farms receive financial assistance from the government,[522] which farmers utilize conservation practices,[523] and which conservation practices are the most effective.[524]

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510. Lara D. Guercio, *The Struggle Between Man and Nature—Agriculture, Nonpoint Source Pollution, and Clean Water: How to Implement the State of Vermont's Phosphorous TMDL Within the Lake Champlain Basin*, 12 VT. J. ENV'T L. 455, 525 (2011).

511. *Id.* at 528–30.

512. Angelo & Morris, *supra* note 257, at 1039 (quoting FLA. STAT. § 373.4592(6) (2013)).

513. Driesen, *supra* note 450, at 553 (citing WILLIAM J. BAUMOL & WALLACE E. OATES, ECONOMICS, ENVIRONMENTAL POLICY, AND THE QUALITY OF LIFE 230, 313 (1979)).

514. *Id.*

515. *Id.* (citing David A. Westbrook, *Liberal Environmental Jurisprudence*, 27 U.C. DAVIS L. REV. 619, 650 (1994)).

516. *See id.*

517. *See id.*

518. *See id.*

519. Ruhl, *supra* note 68, at 337–38.

520. Ristino & Steier, *supra* note 14, at 107.

521. *Id.*

522. *Id.* at 103.

523. *Id.* at 104 ("This scientific knowledge is critically needed to inform and improve Farm Bill policy. Without site specific data, researchers cannot determine which conservation practices actually work and under what specific conditions.").

524. *Id.*

This bar to transparency "creates a nearly impenetrable hurdle for scientists and researchers to study the real-world impact of Farm Bill policies on the ground . . . ."[525] It also "prohibits citizens from knowing how and to what effect public dollars are being spent."[526] This lack of information also hurts the agriculture industry because, "[f]or farmers, information support can help overcome challenges associated with modifying farming practices to reduce water pollution."[527] Additionally, if farmers had access to information explaining the conservation practices implemented by their neighbors and how effective those practices were, farmers could more effectively and more quickly make such changes to their operations.[528] But a lack of information also likely helps the industry continue to pollute the nation's water and externalize its costs while still receiving subsidies.[529]

To solve this pervasive issue, "Congress must affirmatively legislate mechanisms that will require governmental data sharing for legitimate public purposes so that human knowledge may grow and improvements to policies and practices may be developed and implemented."[530] Several relevant examples exist that Congress could emulate. A previous informational program, Toxic Release Inventory (TRI) program, was implemented to report the toxic chemicals released from manufacturing industries.[531] TRI's release of such information caused "beneficial pollution reduction effects"[532] and "illustrates how information can facilitate education of regulators, the public, and industry about the magnitude of pollutant releases."[533] Finally, such a program for agriculture was implemented by California.[534] Establishing that program, which maintained stringent pesticide application reporting requirements[535] and made the resulting data public,[536] reduced pollution[537] and demonstrated the feasibility of such a program without being cost prohibitive.[538]

525. *Id.* at 107.

526. *Id.*

527. Pollans, *supra* note 73, at 1259.

528. Linda S. Prokopy et al., *Adoption of Agricultural Conservation Practices: Insights from Research and Practice*, PURDUE EXTENSION (May 2014), https://www.extension.purdue.edu/extmedia/FNR/fnr-488-w.pdf.

529. Ristino & Steier, *supra* note 14, at 98.

530. *Id.* at 107.

531. Ruhl, *supra* note 68, at 337.

532. *Id.*

533. *Id.*

534. *Id.* at 338.

535. *Id.*

536. *Id.*

537. *Id.*

538. *Id.* ("These accomplishments demonstrate that a national FRI that fully adopts the TRI data collection and reporting system is feasible, not cost-prohibitive to farmers or the public, and of potentially tremendous benefit to future policy decisions.").

D. Restructuring Federal Law

From the previous review of existing environmental regulations addressing water pollution, it is evident that a change aiming to reduce agriculture's water pollution requires a significant restructuring of existing environmental laws.[539] The preeminent shortcoming of the current amalgam of environmental regulations is that agriculture's water pollution is generally exempt from compliance with such regulation.[540] Thus, Congress should amend these regulations to eradicate these exemptions.

For example, there are several agricultural pollution sources that are currently deemed nonpoint sources, and as such, are exempt from the CWA.[541] The exempt sources include some irrigation return flows, agricultural stormwater discharges, and CAFOs.[542] Congress should recharacterize these as point sources, which would then subject them to regulation under the CWA.[543] Additionally, in regard to minimum water quality and monitoring standards for the United States, "the EPA could promulgate a menu of water quality criteria corresponding to various acceptable designated uses in various regions and in various types of water bodies. . . . States would retain authority to designate uses, but would be required to adopt the EPA's criteria."[544] Similarly, the EPA could also institute water monitoring requirements for states.[545] The federal government could pull funding from states that do not maintain appropriate monitoring obligations, assessment protocols, and water quality standards.[546]

CONCLUSION

A specified "goal of environmental law is to reallocate the external costs of pollution onto the polluters themselves."[547] Agricultural exceptionalism frustrates the achievement of that goal as it has generally disconnected concern for pollution costs from conventional agriculture's decision-making.[548] Scholars have identified and analyzed the lasting societal damages that agricultural

539. *See* Pollans, *supra* note 73, at 1248–59.

540. Foscolo & Zimmerman, *supra* note 6, at 317; *see also* Weil, *supra* note 223, at 199.

541. Williams, *supra* note 509, at 119.

542. *Id.*

543. *Id.*

544. *Id.* at 113.

545. *Id.* ("[T]he EPA could establish monitoring and assessment protocols that the states would be required to follow.").

546. *Id.* ("States that fail to adopt appropriate water quality standards and monitoring and assessment protocols would face loss of federal funds.").

547. Foscolo & Zimmerman, *supra* note 6, at 318.

548. *Id.* ("The influence of agricultural exceptionalism has largely uncoupled this feedback cycle from conventional food production systems.").

exceptionalism causes,[549] but they have not recognized the extent to which this exceptionalism harms the agriculture industry itself.

Through the lens of the Porter Hypothesis, this Article argues that the industry is a victim of its own preferential treatment. Specifically, it claims that agricultural exceptionalism disincentivizes the industry from developing solutions to address its water pollution problem and also limits competition within the industry.[550] Conversely, if agricultural exceptionalism were curtailed, the industry would respond with innovative solutions to its water pollution problem, resulting in a more competitive environment.[551] These improvements would ultimately reduce water pollution and limit the attendant harms to society and the industry.[552]

549. *See* sources cited *supra* note 17.

550. *See generally* Porter & van der Linde, *A New Conception*, *supra* note 12.

551. *See generally id.*

552. *See generally id.*